Paper
TRADE JOURNAL

Mar. 2, 1951

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For *best* results, consult Egan—designers and manufacturers of machinery for the paper converting industry.

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Don't miss the advertisement on page 21, this issue, showing the Egan Polyethylene Coating Machine.

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Designers and builders of: Treaters, Gummers, Laminators, Crepers, Air Dryers, Waxers, Coaters, Festooners, Saturators, Printers, Embossers, Winders and Special Machinery for Paper Converting.
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easy access prevents trouble with this valve

Remove just two nuts to dismantle this gate valve for inspection, cleaning, or repairs—without taking it from the line. Reassemble just as easily, knowing that Crane clamp design keeps the bonnet joint snug and accurately aligned. Use Crane Clamp Gates on steam, water, and air, but especially in heavy fluid lines needing periodic cleanout. They'll save time, labor, and encourage regular servicing that prevents valve trouble.

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SYMBOL (JAN-P-117)

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WE RECOMMEND . . .

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RESYN 20R3647	RESYN 20R3647
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RESYN 45-172	RESYN 45-172
RESYN 24R3412	RESYN 3647
RESYN 3647	RESYN 20R3647
RESYN 20R3647	

(actual stock should be tested)

If you handle "DO" rated shipments or any type of military packaging, here's a constant and invaluable source of reference. It's authoritative. It's completely up to date. Compiled after years of close cooperation with a variety of Government agencies.

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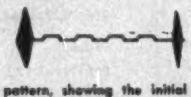
Supersonic waves are sent into the material under test. Upon reaching the other side, or upon reflection by a discontinuity, the waves return to their source and are then converted into a high-frequency potential. This potential is amplified by electronic circuits and projected upon the screen of a cathode-ray tube where they may be seen and examined.



Pulse pattern, showing the initial pattern at the extreme left and the reflection from the opposite side at the extreme right. The sweep line indicates no defects.

A typical indication of a defect is illustrated here. By means of calibration, it is now possible to determine both the exact position of the flaw, as well as its size.

Today, Supersonic testing is available on specification for inspecting Grinnell prefabricated piping. By observing the pattern produced by the electron beam on the fluorescent screen, any defects in the base metal, welds, or variations in pipe thickness can be located and measured at a glance.

Grinnell's ultra modern electronic testing can be relied upon to detect hidden flaws in pipe materials, to check unerringly the quality of welds where it picks up types of flaws not revealed by X-ray and gamma ray inspection. In examining bends, this type of testing can measure the degree to which bent pipe thins on the outside and thickens on the inside of the bend, assuring full specified thickness in high temperature, high pressure work.

Non-destructive Supersonic testing is another in a constant succession of new techniques employed by Grinnell to provide prefabricated piping which is safe and dependable . . . which measures up in every way to *rigid* state, national, association and insurance code requirements. It is another reason, too, why it will pay you to think of Grinnell "Whenever Piping Is Involved".

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Paper TRADE JOURNAL

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NEXT WEEK

Story of the New Mill of Potlatch Forests, Inc. at Lewiston, Idaho.

REMEMBER THESE DATES

MARCH 6-7: Seventh National Marketing Conference, U. S. Chamber of Commerce, Hotel Fairmont, San Francisco, Calif.

MARCH 21: Commercial Chemical Development Ass'n Meeting at the Roosevelt Hotel, New York City.

APRIL 3-5: National Paper Trade Assn., Annual Convention, Waldorf Astoria, N. Y. C.

APRIL 17-20: American Management Assn., 20th Nat'l. Packaging Exposition, Auditorium, Atlantic City, N. J.

APRIL 30 - MAY 4: Materials Handling Conference; Held concurrently with Nat'l. Materials Handling Expo., International Amphitheatre, Chicago, Ill.

MAY 4-5: American Pulp & Paper Mill Supts. Ass'n, Northwestern Div., Spring Meeting, Radisson Hotel, Minneapolis, Minn.

MAY 7-13: Forest Products Research Society, Annual Meeting and Industry Show of 1951, Convention Hall, Philadelphia, Pa.

MAY 13,16: American Institute of Chemical Engineers, Regional Meeting, Hotel Muehlebach, Kansas City, Mo.

JUNE 3-6: National Paper Box Mfrs. Assn., Haddon-Hall, Atlantic City, N. J.

JUNE 24-28: Superintendents National Convention, Multnomah Hotel, Portland, Ore.

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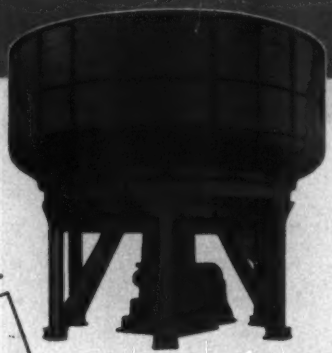

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In the U. S.	597
In Canada	70
Abroad	88
TOTAL	755

Soon the total will be at the 800 mark, equipping the mills of the world with enough capacity to slush from 25,000,000 to 40,000,000 tons of material annually.

- ✔ Six different kinds
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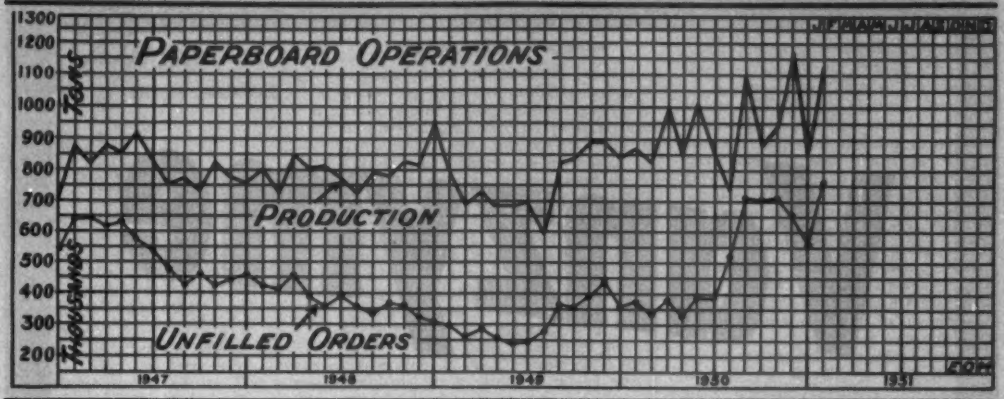

Weekly Brief of Important Figures

Source	Production	WEEK ENDING Feb. 17, '51	Jan. 20, '51	Feb. 18, '50
APPA	Paper Production Percent Capacity[3]	103.1	101.8	95.0
	Unbl. Kraft Paper Production Percent	99.9	93.3	94.2
NPA	Paperboard Operating Ratio Percent Inch Hours	105	104	92
		Dec. 1950	Nov. 1950x	Dec. 1949
APPA	Paper Production[6] (Except Newsprint and Building Papers) ....Tons	795,000	872,000	739,789
	New Orders ....Tons	792,000	831,000	729,665
	Unfilled Orders ....Tons	862,300	869,900	486,860
	Shipments ....Tons	805,000	872,000	739,566
		[4]Jan. 1951	Dec. 1950	Jan. 1950
NPA	Paperboard Production ....Tons	1,176,679	862,905	858,800
	New Orders ....Tons	1,349,991	778,394	860,300
	Unfilled Orders ....Tons	761,828	617,245	337,800
	Our Customers Activities Index[1]	Latest Mo.[5]	Previous Mo.[5]	Year Ago[5]
FRS	Manufactures Total Index	226	230	180
	Durable Mfg. Index	260	264	181
	Nondurable Mfg. Index	198	202	178
	Chemical Products Index	283	282	247
	Mfg. Food Products Index	166	177	162
	Printing and Publishing Index	182	183	167
ODC	Magazine Advg.-Printer's Ink Index	342	342	308
	Retail Sales Combined Adjusted Index	324.0	322.9	301.0
	Drug Index	219.9	223.4	215.7
	General Merchandise Group Index	314.8	299.5	286.9
	Grocery and Combination Index	398.6	394.8	365.6
	Prices Index			
BLS	Consumers Price Index[1]	175.6	174.8	168.6
	Wholesale all Commodities[2]	171.6	169.1	151.6
	Wholesale Foods[2]	175.2	172.5	158.9
	Commodities other than Farm Products and Foods[2]	163.5	161.5	145.0
	Wholesale Pulp and Paper[2]	178.6	173.4	156.5
	Purchasing Power of Dollar, Consumers Prices[1]	56.9	57.2	59.3
	General Activity Index			
FRS	Mfg. Production-Worker Payroll	415.8	403.4	320.9
	Unemployment Compensation Initial Claims (M)	907	720	1,545
	Miscellaneous Carloadings–Thousands of Cars	1,569	1,673	1,250
	Electric Output (Million KW hr.)	34,072	34,307	28,616
PTJ	Average 32 P & P Common Stocks as of Feb. 20	$37.98	$31.99	$31.19
	Average Indicated Dividends Common Stocks as of Feb. 20	$ 2.39	$ 2.39	$ 2.29

[1] 1935-39=100 Unadjusted Index
[2] 1926=100
[3] New 6-7 day basis.
[4] For Five Weeks
[5] For details see APPA Monthly Statistical Summary—December 1950 Estimated Figures
[6] Latest Month Available on Request
x Unrevised figures.

Vanzyme

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for

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Paper TRADE JOURNAL

TRENDS

Office of the PAPER TRADE JOURNAL,
Wednesday, February 28, 1951.

It may be that we as individuals are as tired of the expression "meeting the challenge" as we are worn out with the problems involved therein. Some accept difficulties stoically, some with spiritual patience, others with weary resignation.

As a nation, we are young and undefeated. Our problems have always been a spur to new effort. The democratic way of life has made us ingenious and resourceful. Undoubtedly the era on which we have entered in defense of our way of life will thus be one of great growth technologically and industrially, as it may well be a period of deepening spiritual and cultural values as we rediscover what is most precious to us.

Convention Atmosphere Optimistic

Theme of the industry's convention in New York last week might well have been: "Meeting the Challenge of the Defense Program." Intra-industry conferences, open meetings, luncheon and dinner talks all drew serious groups intent on getting the facts. The prevailing atmosphere, however, was lively and optimistic, though permeated with problems for which no full answer is immediately foreseeable.

Raw Material Supply

The world market pulp shortage and its effect on the defense program is doubtless the No. 1 headache and the one least likely of solution in the early future, because of its international scope.

A factor which must be reckoned with by pulp producers and consumers is the possibility of an easing of pressure of demand for paper and paperboard, in the opinion of T. R. Wilbert, vice-president of Elof Hansson, Inc., New York importers.

"Whether we have a shortage of market pulp during 1951 depends principally upon whether the demand for paper and board continues at the current rate," said Mr. Wilbert. "Any reduction in demand, even as little as 5 percent, would probably result in substantial easing of the pressure on the market pulp in the U. S. and eventually throughout the world. I do not predict any such falling off in the demand, but simply repeat that it is a possibility which must be weighed by all. Government requirements for paper and board do not account for a 20 percent increase in demand over the 1947-49 average. It remains to be seen what effect ceiling prices, high tax rates and restrictions on credit will have on consumer demand."

Pulp Imports and Ceiling Prices

Highlighted question in convention gatherings was the probable action of the Office of Price Stabilization (OPS) on pulp imports. Second quarter prices are due to be announced early in March, and a sharp rise may be in the works, say some, as they point to the report of a $300 price for Scandinavian pulps to Britain.

Importers are working with OPS officials in Washington on the problem, which also affects imports of other strategic and critical materials. In the opinion of some Washingtonians, more pressure by the industry will bring action. At a time when everyone is converging on the OPS and NPA with problems, it is said, the wheel which squeaks loudest is soonest heard.

Establishment of an export-import division in the New York office of OPS, under an export-import specialist, is seen by the trade as a helpful move. Also needed is an import subdivision in the Pulp and Paper Division under Mr. Worrell, it is stated.

Pulp Export Restrictions

Washington action which on February 20 placed certain grades of chemical and mechanical wood pulps on the positive list requiring validated licenses for export is seen as an involvement of ECA needs also as a deterrent to Soviet-area shipments.

Selections from the address of Joseph E. Atchison, chief, Pulp and Paper Branch, ECA, to the Export Committee of the APPA last week tell of the long-term trend and its requirements.

"European industry is at this moment desperately in need of increased quantities of certain grades of pulp and paper which must be made available if it is to play its full role in the mutual defense effort," Mr. Atchison stated as he detailed the losses of pulpwood areas to the Soviet and her satellites, the over-cutting of the Black Forest area of Germany, and the loss of pulp production capacity in Finland and Germany.

"Add this tremendous loss in pulp production capacity of more than 2,000,000 tons per year to the loss of more than 1,000,000 cords of pulpwood imports per year," he said, "and it is not very difficult to understand the reasons for the shortages existing in Europe today."

OEEC Asks For Wood Pulps

"Just recently, the OEEC Pulp and Paper Committee sent to the U. S. to make an urgent plea for assistance in obtaining additional supplies of certain grades of woodpulp which are in critical supply. . . . They have estimated deficits of 200,000 long tons of unbleached kraft pulp and 70,000 long tons of dissolving pulp during 1951. . . . In making these estimates, only minimum needs were considered. The unbleached kraft pulp will be used for production of kraft paper for multiwall shipping sacks and paperboard for shipping containers. These items are of extreme importance to the defense effort for packing cement, fertilizer, chemicals and other items for both domestic shipment and for export. In fact, some cement plants in Europe have been forced to curtail operations because of the shortages of multiwall bags. In other cases, expansion of cement plant capacity has been held up because of lack of prospects of obtaining sacks. The dissolving pulp is badly needed . . . for the production of artificial textiles, including high tenacity rayon tire cord for heavy military vehicles. . . . It does not even take into consideration the tremendous potential demand for dissolving production of nitro-cellulose for direct military purposes. These shortages promise to have far reaching effects of the whole European defense program. Therefore we have been considering all possible methods of solving the problems involved," Mr. Atchison said.

Short-term Standpoint

"From the short-term standpoint, the most logical solution involved is shipment of pulpwood, woodpulp and paper to Europe from the Western hemisphere. . . . The requirements will be greater than ever during the next year if Europe is to play its proper role in the mutual defense effort. . . . One of our most recent authorizations was for $2,800,000 for purchase of pulpwood in Canada by the French newsprint mills. . . . We feel very strongly that these purchases of pulpwood in Canada are highly essential if Europe's free press is to be supplied with adequate quantities of newsprint to spread the gospel of the free world."

Allocations for Pulp Planned

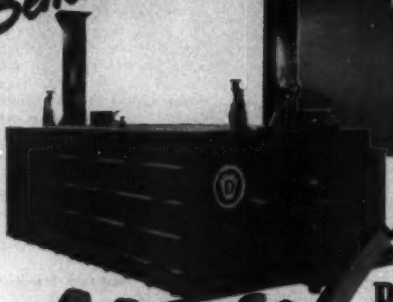
"In all discussions of the problem to date, it has been the unanimous opinion of both industry and government leaders that no additional deliveries of pulp and paper to Europe in 1951 would be possible unless an allocations system for pulp is established in the U. S. and the use of pulp and paper restricted to essential purposes. It also is the general opinion that such a system of allocations and restrictions on end-use must be put into operation eventually. The time is as yet uncertain." (ED. NOTE: The date for the system of allocations is rumored to be about July 1.)

—E. P. N.

Paperboard Production (Tons)*

	Feb. 17 1951	Feb. 10 1951	Feb. 18 1950
Production	243,154	237,247	205,712
New Orders	215,033	226,546	179,849
Unfilled Orders	718,490	748,012	244,030

* Source: NPA.



NOW DOWNINGTOWN PROFLOW AND CONFLOW* VATS

For Improved Sheet Quality

Back in the days of early paper making, the VATMAN did the work of the cylinder machine and his production could only be improved by securing a *better* vatman. Cylinder machine production can be improved, too, but by modernization . . . by the addition of new, tested equipment and ideas.

One method of improving cylinder machine production is through the installation of modern Downingtown PROFLOW or CONFLOW vats. These vats have approach flow and stock inlet characteristics engineered, designed and manufactured to insure a well-formed sheet of uniform weight and caliper.

As their names imply, in the PROFLOW vat the stock flows *with* the direction of the cylinder mould; in the CONFLOW vat the stock flows *opposite* to the direction of the cylinder mould.

Other improvements in cylinder machine production can be made with the addition of Downingtown Suction Slices or Cylinder Couch Rolls for faster water removal at the nip.

A Downingtown engineer will make recommendations for improvement of your cylinder machine operation without obligation. For further information write . . .

These features of Downingtown PROFLOW and CONFLOW vats hold weight and caliper to the close tolerance demanded in the production of quality sheets:

- Correctly designed approach flow inlet
- Adjustable making board
- Special chime ring sealing strap
- Anti-friction bearings for Couch Roll and Cylinder Mould
- Adjustable overflow
- Adjustable wing boards and auxiliary wings
- Choice of materials:
  - a. Welded Stainless Steel
  - b. Cast iron ends with plain wood body or metal lined
  - c. Cast iron with corrosion resistant metal circles

*"PROFLOW" and "CONFLOW" Reg. U.S. Pat. Off.

DOWNINGTOWN MANUFACTURING COMPANY, DOWNINGTOWN, PA.

Pacific Coast Representative: John V. Roslund, Pacific Bldg., Portland 4, Oregon.

DOWNINGTOWN

PROFLOW and CONFLOW VATS

The Modern Method of Board Formation

DESIGNERS AND BUILDERS OF PAPER MAKING MACHINERY SINCE 1880

News of the Week

Paper TRADE JOURNAL

NOW HOWE SOUND PULP CO.

Canadian Forest Products Limited, which recently took over the Sorg Pulp Co.'s plant at Port Mellon, B. C., will change the name of the company to the Howe Sound Pulp Co., Ltd. Formal application for change of name has been listed with the Registrar of Companies at Victoria.

The Sorg plant, which was operated during the war by the Sorg Paper Co. of Middleton, Ohio, was taken over recently by the Vancouver company, which is headed by J. G. Prentice and L. L. G. Bentley.

Work is now underway at the mill, which is situated on Howe Sound, and is one of the pioneer pulp operations on the coast.

It is understood here that capacity of the kraft producing mill will be increased and plans are underway to make it one of the most modern operations on the coast.

So far no announcement has been made by any of the participating companies in the deal, but it is reported in Vancouver that the mill is expected to be in operation within two months.

Registered office of the new company is at 675 West Hastings street, Vancouver, B. C.

BAGASSE UTILIZATION

A practical method for separating pith and fiber of bagasse, which may open up new industrial outlets for three by-products of the sugarcane industry and could offset rising operating costs and increase profits of cane-sugar mills, was announced at the annual meeting of the American Society of Sugar Cane Technologists at Houma, Louisiana.

This new information, a result of research on bagasse utilization by the U. S. Department of Agriculture's Bureau of Agricultural and Industrial Chemistry, was presented by Dr. E. C. Lathrop of the Bureau's Northern Regional Research Laboratory at Peoria, Ill., where the research was conducted.

Dr. Lathrop said that maximum profit from these sugarcane by-products would result only if the sugar industry itself undertook the recovery problem, instead of leaving it to others.

MOVED AGAIN

At this moment, The Pulp, Paper and Board Section NPA is located at Room 102, Old General Accounting Bldg., F street between 4th and 5th, Washington.

Daniel K. Beswick has been appointed as vice-president in charge of sales of Carton Label & Lithograph Co. Mr. Beswick has been associated with Zellerbach Paper Co. for the past 15 years and during the past 5 years has been Sales Manager of the Printing Paper Dept.

NATIONAL GYPSUM'S NEW MILL

Construction of the $4 million National Gypsum Co. paper plant on the Oklahoma Ordnance Works site south of Pryor, Okla., started February 9. It will produce paper for use in the company's wallboard products as well as other purposes. Site of the plant in the area was changed after the federal government ruled the original site was too close to the powder plant.

ANOTHER MILL NEAR PRYOR

OKLAHOMA CITY, Okla. — Coronado Manufacturing Co., Chicago, has signed a contract with the Dan Tankersley Construction Co., Oklahoma City, for construction of a huge paper mill near Pryon, it was announced by Governor Johnston Murray, who has been active in aiding the campaign to get the company to locate in the Grand River dam area.

The new plant, to cost $5 million, will manufacture wallboard and paper. The plant will be located on the banks of the Grand River adjacent to the Grand River Dam authority steam plant and railroad spur.

SURVEY OF NPA ORDERS

WASHINGTON, D. C. — Spot surveys to ascertain how NPA orders are operating, are to be made by the Federal Trade Commission at the request of the National Production Authority.

The surveys will endeavor to check on the understanding of NPA orders out over the country, and how well they are being carried out, it was stated. The first survey will be among aluminum fabricators and information from this and subsequent check-ups will be used in planning future orders.

BRUNSWICK EXPANSION

BRUNSWICK, Ga. — Gordon Singletary, manager of the Brunswick Pulp & Paper Co., reports that its bleached sulphate pulp mill, established in 1938, is in the midst of its third expansion program.

"Another $5 million is being invested to bring the production capacity to 400 tons daily, almost three times the original 150-ton installation," Mr. Singletary said in an interview. The total investment will be $15 million.

Expansion is being hurried through to completion by August 1.

Keneth Geohegan
New President of TAPPI

C. E. O'Connor
New President of Tissue Assn.

LEWIS HOUSE

Through a gift of the late Harry S. Lewis of Beaver Falls, N. Y., Clarkson College of Potsdam, N. Y., expects to begin construction soon of a student center to be known as "Lewis House." Mr. Lewis served as a member of the Clarkson College Board of Trustees.

JANUARY NEWSPRINT REPORT

NEWSPRINT ASSOCIATION OF CANADA, MONTREAL

I. PRODUCTION AND SHIPMENTS in short tons: 2,000 pounds		JANUARY 1951	JANUARY 1950	JANUARY % Change	YEAR TO DATE 1951	YEAR TO DATE 1950	YEAR TO DATE % Change
1. Canadian Production: including Newfoundland	month and year to date	453,019	417,011	+ 8.6	453,019	417,011	+ 8.6
	per working day	17,491	16,548	+ 5.7	17,491	16,548	+ 5.7
	percent of capacity	100.5	97.2		100.5	97.2	
2. Canadian Shipments: including Newfoundland	to United States	376,412	360,183	+ 4.5	376,412	360,183	+ 4.5
	to Canadian Consumers	28,438	28,673	— .8	28,438	28,673	— .8
	to Other Markets	18,493	14,157	+30.6	18,493	14,157	+30.6
	total: all markets	423,343	403,013	+ 5.0	423,343	403,013	+ 5.0
3. U.S. Shipments:...	month and year to date	92,691	74,275	+24.8	92,691	74,275	+24.8
4. U.S. Shipments:...	to U.S. Consumers	92,219	74,884	+23.1	92,219	74,884	+23.1
	to Other Markets	772	1,196	—35.5	772	1,196	—35.5
	total: all markets	92,991	76,080	+22.2	92,991	76,080	+22.2
5. U.S. Imports from Europe:	*estimate; see Table 8	*15,500	15,824	— 2.1	*15,500	15,824	— 2.1

II. CONSUMPTION AND STOCKS in short tons: 2,000 pounds		JANUARY 1951	JANUARY 1950	JANUARY % Change	YEAR TO DATE 1951	YEAR TO DATE 1950	YEAR TO DATE % Change
6. U.S. Consumption:..	estimated total	451,702	451,102	+ .1	451,702	451,102	+ .1
7. North American Stocks:	U.S. Consumers	607,947	608,596	— .1	607,947	608,596	— .1
	Canadian Mills	118,818	135,188	—12.1	118,818	135,188	—12.1
	U.S. Mills	7,941	9,009	—11.9	7,941	9,009	—11.9
	estimated total	734,706	752,793	— 2.4	734,706	752,793	— 2.4
8. A.N.P.A. Report:.. 525 Newspapers	Consumption	345,552	345,093	+ .1	345,552	345,093	+ .1
	Stocks (tons)	440,124	441,638	— .4	440,124	441,638	— .4
	Stocks (days)	39	40		39	40	

INDIA'S DEVELOPMENT PLANS

At a recent meeting convened by the Planning Commission of the Government of India to discuss problems facing the Indian paper industry, in which the representatives of the industry took part, the following facts came to light:

Present Position

Mills producing paper—12
Mills producing paper and pulp boards—3
Mills producing straw boards—17

Development Plans

Number of mills contemplating expansion—6
Number of units planned for producing paper and newsprint—4*
*Of these, one started production during December, 1950; two will go into production in 1951; the fourth one is designed entirely for the manufacture of newsprint.

Efficiency

The paper industry is working almost to capacity which is 1,15,000 tons for all varieties of paper. The designed capacity will be 1,800,000 tons by 1952 end.

Imports

There is not manufactured enough pulp to go round so that a good quantity of chemical pulp is imported from abroad.

Imports of paper including newsprint for 1940-50: 63,350 tons.

Import of paper making materials: 14,050 tons.

Exports

(Chiefly to Malaya and Burma): of paper, paper boards and paper making materials: 9,216 tons

Demand

Estimated domestic consumption of paper for the coming three years is 1,750,000 tons per annum and it is expected to strike the 2,000,000 tons mark in 1956.

Difficulties Facing the Industry

1. Obtaining suitable raw materials in adequate quantities.
2. Which is occasioned by unsuitable locations — far from raw material sources and
3. Lack of adequate transport facilities and
4. The necessity to import chemicals (particularly sulphur and caustic soda) from abroad.
5. Lack of technical personnel is another.

Suggestions

1. Specific forests areas should be reserved for the paper mills and long-term leases granted.
2. There should be a rational distribution of railway transport facilities.
3. A coordinated policy in regard to forest management should be adopted.

It was also disclosed that

1. Experiments are being made at the Forest Research Institute, Dehra Dun with indigenous trees and grass for manufacturing paper and boards.
2. There are large sources of raw materials suitable for newsprint in Northern India such as silver fir and spruce.

AT NEW LOCATION

Milwaukee Lace Paper Co., 1306 E. Meinecke avenue, Milwaukee 12, Wis., announces the new location of their Pacific Coast Division as 1140 Walsh avenue, Santa Clara, Calif.

CLEVELAND CONTAINER PLANT

MEMPHIS, Tenn. — Cleveland Container Co., Cleveland, Ohio, manufacturers of combination metal and paper cans, cores, tubes, etc., has taken a long-term lease on the former M. M. Bosworth Co. plant, 1076 Texas, and will start manufacturing operations here at an early date.

SCOTT TRAINING PROGRAM

Scott Paper Co. has inaugurated a broad and intensive training program for all shift supervisors in the Paper Mill Division of its Chester plant. Under the program each shift supervisor will be trained individually for a four-week period in paper mill management and in other operating divisions of the plant.

The course will enable shift supervisors to assume more responsibility in the paper mill. It is intended to lighten the load of present division managers and serve as a training ground for future ones.

HYDRO-ELECTRIC PROJECT

HARTFORD, Conn. — An engineering survey to determine the feasibility of a future hydro-electric project on the Housatonic River above Lake Zoar in Connecticut—advocated by many of the paper mills along the river—is being made by the Connecticut Light & Power Co.

Charles T. Main & Co., Boston engineering firm, which made a study of the area 25 years ago for the utility and found the project unfeasible at that time, has been engaged to make the new study.

NEED EXPORT APPROVAL

WASHINGTON, D. C. — Sulfur and carbon black have been added to the list of commodities which will require export approval effective March 10.

In addition, export quotas for certain wool commodities have been established for the first quarter, 1951; these are, wool rags, woven and knit, 10 million lbs.; wool yarns, 50,000 lbs.

Other export restrictions also have been announced as follows:

Effective February 20, validated export licenses are required for shipment to designated countries of paper base stocks including sulfite wood pulp, bleached, other than rayon and special chemical grades; unbleached sulfite pulp; soda wood pulp; unbleached sulfate wood pulp; also bleached; semi-bleached; groundwood pulp, other wood pulp and screenings.

NEW CHLORINE PLANT

WASHINGTON, D. C. — Immediate construction of a chlorine-caustic soda plant near Muscle Shoals, Ala., and near the Phosphate Development Works in that vicinity, has been authorized by the Army, at an initial cost of $5 million.

The plant will produce chlorine needed for the Chemical Corps.

DICKERMAN NAMED DIRECTOR

Murlyn B. Dickerman of Missoula, Mont., has been appointed director of the Lake States Forest Experiment Station in St. Paul, Minn., the U. S. Department of Agriculture stated February 26.

He has been chief of the Division of Forest Economics of the Northern Rocky Mountain Forest Experiment Station, Missoula, since November 1946. He will succeed Elwood L. Demmon, who was appointed last week as director of the Forest Service's experiment station in Asheville, N. C.

PERMIT FOR WASTE PAPER

OTTAWA — Waste paper has been added to the list of items for which a permit will be required for export to all countries in order to control abnormal movements of such items, Department of Trade and Commerce, Canadian Government, announced.

TIN CONSERVATION

WASHINGTON, D. C. — Tin-bearing drosses, residues, etc., cannot be used for making coated paper under the new tin conservation order of NPA.

NATIONAL FOREST TIMBER

WASHINGTON, D. C. — Sales of national forest timber, halted since January 29 pending establishment of a procedure to set ceiling prices in conformity with the recent order of the Office of Price Stabilization, will now be resumed by field offices of the Forest Service.

Lyle F. Watts, Chief, Forest Service, has instructed regional foresters to permit the sale of national forest timber at prices not to exceed the highest stumpage rate paid in each region for each species-product class during the base period of December 19 to January 25 inclusive.

SANDY HILL GETS CONTRACT

ECA has approved dollar financing of $1,169,284 for the modernization of two pulp and paper mills of Arland Papier und Zellstoffabriken A.G., Gratz-Andritz, Austria. Of the total amount, $347,000 was to be used to purchase modern pulp machinery for the company's sulphite pulp plant at Rechberg, and $822,000 for modern paper machines and auxiliary equipment for the fine-paper mill at Andritz.

The Arland Co. has placed with the Sandy Hill Iron and Brass Works, Hudson Falls, N. Y., orders for: Inlet and Fourdrinier section for a paper machine, $250,000; various auxiliary equipment and spare parts, $25,000.

Approximately $800,000 still is not committed on this industrial project.

CHANGE IN OWNERSHIP

Erie R. Smith and George H. Ferguson have acquired the A. H. Johnson & Co., Consulting Engineers. The new owners, long associated with Alvin Johnson in the consulting business, will carry on under the same name, same staff and at the same location.

Group of four Williams Standard Sheet-making Outfits, four Williams Precision Freeness Testers, Four Williams Standard Paper Moisture Testers built by the Williams Apparatus Co. Inc. for the Province of Quebec, (School of Papermaking) Ecole Provinciale de Papeterie, Three Rivers, P.Q., Canada.

3 BILLS FOR NEW SOURCES

WASHINGTON, D. C. — At least three bills in the House, aimed at providing for expansion of ramie, and kenaf crops in the United States or contiguous areas, and for free import of twine into this country, have renewed attention to World War II efforts to give this country new sources of industrial fibres, used in paper, rope, and other manufacture.

At the same time, the Reconstruction Finance Corp. reports that efforts are under way to learn if abaca waste, resulting from operations of the government-sponsored abaca plantation in Central American countries, cannot be adapted to paper manufacture or other uses.

Incidental to its report on postwar maintenance and development of abaca plantations in various Central American countries, the RFC commented that, at present, after stripping of the fiber, the remainder of the abaca plant goes to waste.

"The fiber included in this waste would have a ready market for paper manufacture and other uses if improvements could be effected in machinery used in its processing, and present costs of its production thereby reduced," said the agency.

All previous efforts to reclaim the fibre from the waste have been abandoned because of cost, and the waste is now dumped on adjacent lands to the plantations, at some cost. However, research is planned to find some means of more efficient recovery and for discovery of possible additional uses and markets for the waste. This research will cost some $150,000 annually for at least the next two years.

Abaca stalk contains a potential of 8 percent of fiber, said the RFC, and recovery is approximately 3½ percent by machines now in use.

NEW CHEMICAL BARGE

VANCOUVER, B. C.—Griffiths Steamship Co. of Vancouver has taken over the powerful deepsea tug MV. Mogul, and is having it converted for the purpose of towing a new steel "chemical barge," which will be the first of its type to be used in British Columbia, and will be utilized solely for the pulp and paper industry.

The half-million-dollar operation marks the return of a Vancouver firm, which was founded in 1912 as Coastwise Steamship and Barge Co., but which has been inactive for the past several years.

The Mogul and its unusual barge will be used to transport a potentially touchy cargo of caustic soda and liquid chlorine under pressure, from Tacoma to the H. R. MacMillan Export Co., pulp plant at Harmac near Nanaimo, and to the new Columbia Cellulose Co. pulp plant, near Prince Rupert.

The 157-foot vessel is now powered by a 1,600 h.p. diesel, is equipped with radar, radio-telephone, and other electronic aids to navigation. It was converted from steam to diesel at B. C. Engineers and Shipbuilders yards in Vancouver.

The big tug's "better half" is a converted LST barge, named the Griffco. It was converted at Victoria Machinery Depot yards in Victoria.

When the 277-foot barge gets into action, it will be the first time on the Pacific Coast that bulk chlorine has been transported in fixed tanks on a barge.

Since part of its bi-monthly voyages will be through American waters, special permission had to be obtained from the U. S. Coast Guard to transport these two chemicals together on the same barge.

The two large, sausage-like tanks, on the open deck of the barge, were

built by Vancouver Iron Works in Vancouver.

Railway tracks have been laid on each side of the long deck tanks, to permit loading of railway tank cars, which can also carry chlorine under pressure. In the holds of the hull are tanks to carry the caustic soda.

Special loading facilities have been designed for discharge of the difficult cargoes, with special attention at the Prince Rupert end, where life for the handling crews is complicated by a tide, which can rise as much as 21 feet without even trying.

A second barge, the Groffson, may also joint the Griffco as a chemical barge later.

The new operation will get underway soon.

BOWATER EXPANSION

OTTAWA — Although the company had finished a $30 million postwar expansion program in 1950, it is understood now that the Bowater's Newfoundland Pulp and Paper Mill is planning to increase its integrated pulp and paper operations in Corner Brook, Newfoundland, by approximately 50,000 tons a year. Efforts are being made to start this new project as rapidly as possible.

C-Z TREE SEEDING

Crown Zellerbach chief forester, Clarence W. Richen, has announced the completion of the company helicopter tree seeding program for the 1950-51 reforestation season. "Helicopters Inc." of Seattle, Wash., started on the 474 acre seeding project of the company's Clackamas Tree Farm; seeded 500 acres on the Columbia Tree Farm; completed a cooperative project of 800 acres in conjunction with the State of Washington at Cathlamet, Wash.; and an area of 500 acres on the company's Clatsop Tree Farm near Saddle Mountain.

TAPPI Medal Presentation

J. N. Stephenson making Presentation to G. H. Tomlinson, Sr., Vice-President and Technical Director, Howard Smith Paper Mills, Ltd.

Members of Panel at Open Meeting National Council of Stream Improvement

Left to right—J. M. Holderby, Manager, By-Products Rhinelander Paper Co.; H. W. Gehm, Technical Director, National Council for Stream Improvement; G. W. Gleason, Dean of Engineering, Oregon State College.

H. H. Black, Chief of Industrial Waste Section, U. S. Public Health Service; W. A. Maggio, Southern Resident Engineer, National Council for Stream Improvement; D. B. Lee, Director, Florida State Board of Health; E. J. Velz, Chairman, Department of Public Health, Michigan State University; H. Paessler, Executive Secretary, Virginia State Water Commission; R. E. Opfercook, South Central Resident Engineer, National Council for Stream Improvement.

Left to Right—A. J. Palladino, Midwest Resident Engineer, National Council for Stream Improvement; J. A. McCarthy, Chief, Lawrence Experiment Station, Mass. Department of Public Health; Dr. W. M. VanHorn, Institute of Paper Chemistry; R. E. Dimick, Chief, Department of Fishing Game, Management Oregon State College; W. S. Wise, Chief Engineer, Conn. Water Commission; W. Rudolfs, Chairman, Department of Sanitation, Rutgers University.

TRAILERS TO HAUL CHIPS

VANCOUVER, B. C.—Further details are now available regarding the new chip-hauling operation, which is being started between Cowichan Lake and the Harmac pulp mill of the MacMillan organization, near Nanaimo, B. C.

Trailers 35 feet in length will haul chips on a 24-hour round-the-clock basis from the chipper plant of B. C. Forest Products, Ltd., at Youbou, to the pulp plant, according to H. Gray, of Gray Motor Co., Duncan, and proprietor of the Youbou Garage, who is contracting for the project.

A growing staff of drivers will be necessary for the work. It involves a round road trip from Youbou of 120 miles, and it is tentatively planned that each truck will make two trips per shift, and be operated for two shifts daily, with a safe time allowance for servicing needs.

Mr. Gray intimated that formation of a company to control operations of the trucks was planned. He said he was hopeful of getting delivery of enough new special-chassis vehicles, despite the effects of a developing war economy on the supply of heavy vehicles.

Each vehicle will represent a 20-ton load, carrying 10 units of chips each displacing 200 cubic feet. Mechanical loading at Youbou, and similar unloading at Harmac, will ensure a quick and efficient service in handling cargoes.

Each truck chassis will embody dual axles, and each truck and trailer will run on 14 tires. Daily gasoline consumption of all trucks will be about 1,000 gallons.

Mr. Gray plans to sub-contract the haulage on a single-truck basis, with sub-contractors to buy their trucks on a "buy-as-you-earn" policy.

Letter to Editor

Dear Mr. Perry:

An inquiry of a steel concern to the Technical Department of our Allgemeine Papier-Rundschau induced me to study the questions of paper formats in foreign countries. People in that concern think it over whether they should write their letters to the different countries of the world in the letter-formats concerned or in the common DIN-format.

Here in this country as well as in some European countries, the DIN-format has made its way. Let me tell you the principles of that format, hoping it will be of interest to you.

DIN means Deutsche Industrie Normen oder "Das ist Norm." The paper formats are divided into 3 series A, B and C. A is the series for so-called "independent paper-formats," B and C for the "dependent formats" i.e. independent paper formats are such, where you can select freely the format (letter paper, note-books, books, etc.), dependent formats are used for envelopes, which have to be a bit larger than the letter-paper, files, where the papers must be secured on the edges.

The A-series is based on the square-meter, i.e. the format DIN A 0 has the same surface just as one square-meter, but the two dimensions of the format are selected so, that the proportion of the length to the width has just the value of $\sqrt{2} = 1{,}414$. The purpose of that proportion is, that by folding the paper once or twice you will get always the same proportion between length and width. DIN A 1 means: you get that format by folding the format A 0 once; DIN A 2 you will get by folding A 0 twice, etc. All formats are so-called "finished formats," i.e. formats for the end products. Therefore, the papermaker needs to produce his "crude-formats" a bit larger than these "finished formats," but these "crude formats" are not exactly prescribed.

The advantage given by the combination of the square-meter with the DIN-formats is to be seen in that you can find out easily by calculation the grammage per square-meter of the paper concerned by multiplying the weight of one sheet

DIN A 1 with 2
DIN A 2 with 4
DIN A 3 with 8
DIN A 4 with 16, etc.

I take pleasure of attaching herewith a list of the DIN-format dimensions.

With regard to the formats for letter paper in the USA, I have found out the following ones as commonly used:
21,5 x 28 cm and 21,4 x 27,3 cm

I should be very much appreciated if you could give me some detailed information with regard to the dimensions used in your country for papers in general as well as for letter papers in particular. If there exists a system for the formats developed one out of the other one, I should be very much obliged to you if you could send me further details with regard to that point of question.

Thanking you in advance, I remain,

Hans Kotte
Technical Editor
Allgemeine Papier-Rundschau
Alfeld/Leine, Germany

Has anyone a data sheet showing all of the common sizes of common grades?

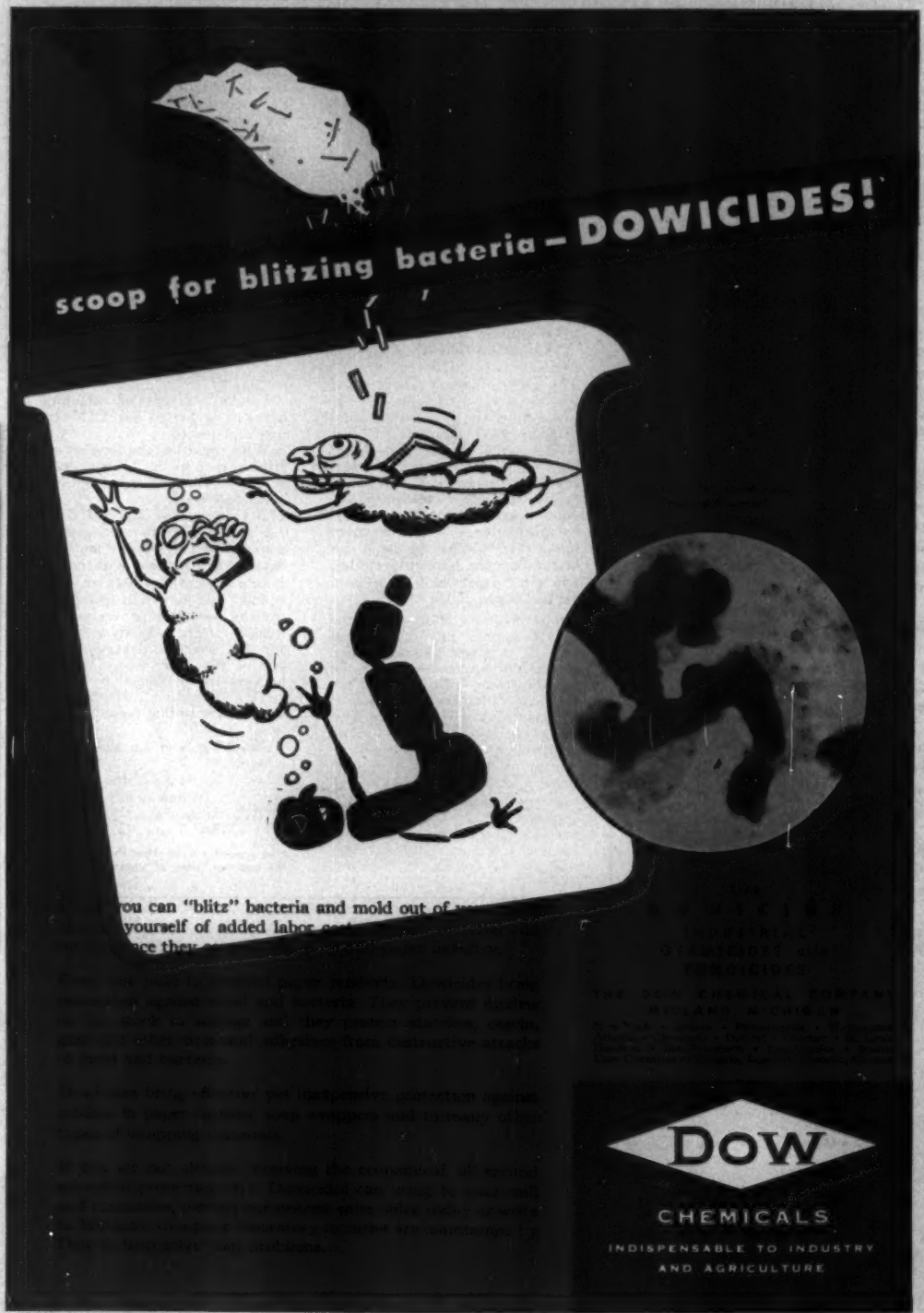
Format Klasse	Benennung	Kurzzeichen	Reihe A mm	Reihe A aus Rohbogen crude formats*)	verwendet für	Reihe B	Reihe C
0	Vierfachbogen	A 0	841 x 1189	860 x 1220		B 0 1000 x 1414	C 0 917 x 1297
1	Doppelbogen	A 1	594 x 841	610 x 860		B 1 707 x 1000	C 1 648 x 917
2	Bogen	A 2	420 x 594	430 x 610		B 2 500 x 707	C 2 458 x 648
3	Halbbogen	A 3	297 x 420	305 x 430		B 3 353 x 500	C 3 324 x 458
4	Viertelbogen (Reichsformat)	A 4	210 x 297	215 x 305	Geschäftsbriefe [2])	B 4 250 x 353	C 4 229 x 324
5	Blatt (Achtelbogen)	A 5	148 x 210	215 x 305	Geschäftsbriefe (Halbbrief)	B 5 176 x 250	C 5 162 x 229 [3])
6	Halbblatt	A 6	103 x 148	215 x 305	Weltpostkarten-grösse	B 6 125 x 176	C 6 114 x 162 [3])
7	Viertelblatt	A 7	74 x 105	215 x 305		B 7 88 x 125	C 7 81 x 114
8	Achtelblatt	A 8	52 x 74	215 x 305		B 8 62 x 88	C 8 57 x 81
9		A 9	37 x 52			B 9 44 x 62	C 9 40 x 57
10		A10	26 x 37			B10 31 x 44	C10 28 x 40
11			18 x 26			22 x 31	20 x 28
12			13 x 18			15 x 22	14 x 20
13			9 x 13			11 x 15	10 x 14

*) Die Papiererzeuger dürfen auch Rohbogen kleinerer Abmessungen herstellen, wenn das Enderzeugnis ein Format der Reihe A ist (zur Ersparnis von Abfällen). Das gleiche gilt auch für Rohbogen grösserer Abmessungen, aber nur in Sonderfällen.

[2]) Fensterhülle für Sendungen umfangreichen Inhalts.

[3]) Briefhüllenformat zum Geschäftsbrief DIN-A4. Auch für Fensterbriefhüllen (dreimaliges Falten des Briefes Notwendig), daneben Langhüllen 110 x 220 mm gebraucht.

[4]) Das Querdrittel von DIN-A4 (99 x 210 mm) ist die Grösse eines Einheitfaltblattes, das in die Normlanghülle (110 x 220 mm) hineinpasst.


scoop for blitzing bacteria – DOWICIDES!
you can "blitz" bacteria and mold out of
yourself of added labor
DOW
CHEMICALS
INDISPENSABLE TO INDUSTRY
AND AGRICULTURE

Stream Improvement Progress*

Regional and National Developments

New England Region

Until fairly recently membership interest in the New England States was centered largely in local pollution situations towards the correction of which Council, industry, and state agency attention had been directed for several years. However, the enactment of U. S. Public Law No. 845, the New England Interstate Water Pollution Control Compact, and new pollution laws in a number of individual states, have served to focus attention on broader problems.

Local pollution problems on the Nashua River in Massachusetts, the Androscoggin River in Maine, and other problems of a similar local nature in Connecticut and elsewhere have been subjected to concentrated attack by the mills and the Council with the result that considerable improvement has taken place.

The deinking mills in Fitchburg have been particularly active in installing remedial works with the assistance of Mr. Joseph F. Baigas, Jr., National Council Resident Engineer in Massachusetts, Crocker, Burbank and Company, Association and the Falulah Paper Company have already installed treatment plants, the one at Falulah having been designed by the National Council. Fitchburg Paper Company has placed an order for a treatment plant which is expected to be in operation by the coming summer. Practically all of the mills downstream from Fitchburg have also installed various pieces of equipment and remedial measures all designed to reduce the quantity and concentration of wastes discharged. The combined effect of these remedial works will be to reduce the load of certain pollutional materials some 90 per cent below previous levels and it is believed that the nuisance conditions, which have been the subject of previous complaints, will be eliminated during 1951.

In Maine remedial measures applied to the discharge of wastes from mills on the the Androscoggin River have proved effective. The Androscoggin River Committee in cooperation with the Maine Sanitary Water Board and Prof. Walter Lawrence of Bates College have been instrumental in this work. The measures adopted consist of process changes and controlled lagooning of the wastes together with the treatment of the river waters with sodium nitrate. These have been effective in that complaints of odor from the river, which have consistently arisen for the past several years, failed to develop in 1950 despite abnormally low flows, high atmospheric temperatures, and other adverse conditions.

Following the survey of all Connecticut mills that the Council conducted in 1949, two individual companies met with Water Commission and Council engineers for the purpose of planning treatment or control measures necessary for their particular mills according to the arrangement arrived at by Water Commissioner Richard Martin and the Committee. In the case of one mill treatment works were designed by Council engineers and the plans approved by the Commission. A program of investigation, as well as immediate operating changes, was advised for the second plant.

Committee activities in this region have, for the past several years, been carried on largely by local sub-committees which are best qualified to function on local matters. However, in November an overall meeting of all New England members was held in Boston with a record attendance of over 100 industry representatives. It is planned to make such overall group meetings a future regular feature of New England activities.

There is difficulty in appraising the specific nature of future pulp and paper industry pollution problems that may develop in New England. The New England Interstate Water Pollution Council Commission is currently classifying the waters of the region and this may have a serious effect on future industry operations. It is understood that these classifications are being made largely on a "present use" basis. It is obvious that the higher the classification adopted for any river the greater will be the requirements for remedial works and the higher, incidentally, will be the required expenditures.

Middle Atlantic Region

Embracing the states of Pennsylvania, New Jersey, New York, Delaware, and Maryland, in which a large tonnage of paper is manufactured, this is a most active region. Since the activities in each state are in many respects peculiar to it, separate industry committees of the Council representing several of the states function in matters concerning them. The need for concerted action has to date been limited to the two states in which most paper manufacturing is done, namely, Pennsylvania and New York. The dynamic committee representing Pennsylvania under the able chairmanship of Dr. Donald T. Jackson of Hammermill Paper Company completed a major project of industry wide importance during 1949 and 1950. This consisted of a survey of mill losses of all Pennsylvania mills conducted in cooperation with engineers of the Pennsylvania Sanitary Water Board and the National Council for Stream Improvement. With these data in hand a classification of processes common to the industry in the state was agreed upon. By use of the information obtained, together with mill survey data from similar operations contained in the Council files, standards for normal

* Excerpt Annual Report National Council Stream Improvement.

raw wastes in terms of suspended solids and BOD per ton of product were calculated. Sub-committees representing each process, or group thereof, reviewed these values and came to agreement concerning them. These were submited to the Sanitary Water Board and, after some minor adjustments, were accepted by that body. A complete report covering these standards has been published by the Council and can be obtained on request. Reductions in waste discharge by Pennsylvania mills will henceforth be determined from the bases established by this report for the processes to which they apply. This work was an outstanding example of industry and government cooperation in stream pollution control work and the many individuals concerned contributed generously toward bringing this project to successful completion.

Development work by Council engineers, as well as mill service on waste problems, has continued at a high level of activity during the last year. Laboratory and pilot plant research on rope and rag mill effluents was conducted in cooperation with several companies and assistance was rendered with respect to the installation and operation of waste treatment equipment at a number of plants. Experimental testing, as well as the application of new equipment applied to white water reuse and fiber recovery, has been followed closely by Council engineers and considerable data were obtained regarding them through the courtesy of the mills and equipment manufacturers.

Rapid strides in the reduction of pulp and paper mill wastes entering surface waters of Pennsylvania have been accomplished to date. A rough estimate indicates that an overall reduction in settleable suspended solids approaching seventy-five percent has been accomplished to date and it is believed that this value will approach ninety percent in another year.

Appreciation of the assistance and cooperation of Mr. F. B. Milligan, Industrial Wastes Engineer of the Pennsylvania Sanitary Water Board, and his staff who have made the progress of the industry in this activity possible is gratefully expressed. Mr. Vaughn C. Behn, Resident Engineer in this region, resigned during the year to accept a position at Johns Hopkins University and has been replaced by Mr. Francis R. Burde who was previously engaged in survey work in other regions of the country. The research project at Rutgers University directed by Dr. Willem Rudolfs has continued to function under the leadership of Mr. Nelson L. Nemerow.

Prior to the passage of the Ostertag Bill, the pulp and paper industry in New York State made considerable progress in reducing mill losses not only from the standpoint of economy but also for stream pollution abatement. However, appreciating the fact that the matter of surface water conservation would become an increasingly important part of industry's public responsibility, a large number of mills joined the Council seven years ago in order that they might keep abreast of the technical developments in waste handling and informed as to the progress made in water conservation throughout the country.

Following passage of the bill, which provided for the appointment of a Water Pollution Control Board, representatives of the Council and executives of the New York State mills met in Albany in early 1950. The purpose of the meeting was to evolve a program whereby this segment of the industry could best assay its waste disposal requirements and assist the State in its stream classification program. Representatives of the industry felt that the Council should take the lead in organizing the industry to carry out this task.

Under the leadership of Mr. Benton R. Cancell, chairman of the committee, the state was divided into drainage areas in which the industry was located. These consist of the Upper and Lower Hudson drainage basins and the St. Lawrence, Black River, Lake Ontario, and Niagara River areas. An executive committee consisting of representatives of each area was organized with James Rogers II serving as chairman. At a meeting of this group priorities were assigned in respect to survey work.

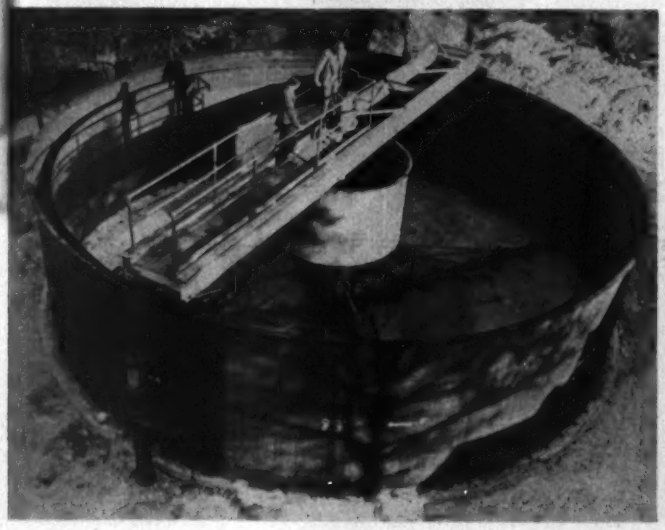
To date, the mills, with the assistance of Council engineers, have made extensive surveys of the Black River basin and the Upper Hudson area. Some preliminary work has also been done on other watersheds and at individual mills. Extensive studies of the mills on the Niagara River were conducted by the industry in connection with International Boundary Commission investigations so that most of the data required for this area are available.

In most instances the problems are of a localized nature. This can be attributed on the one hand, to the fact that so many of the mills are comparatively small producers, and on the other, to the large dilution afforded most mill effluents by their location on large waterways. It is believed that equitable and progressive classifications can be developed with the State which will be advantageous to all water users.

Also of interest in the Middle Atlantic Region are the activities of the Delaware Water Pollution Commission under the Chairmanship of Mr. Lyman Cox, Industrial Waste Consultant to E. I. du Pont de Nemours & Co. Engineers of the Commission are now engaged in making plant surveys of all industries discharging wastes.

In New Jersey, attention continues to center on the Delaware River with respect to its more extensive use for municipal water supply.

Clarifier at Falulah Co. deinking waste disposal plant constructed as part of Nashua Riverr, Mass. cleanup.



Southern and South Central Region

In this region membership interest during 1950 was divided equally between the various field and direct mill services rendered by the Council and the research activities carried on at Virginia Polytechnic Institute and Louisiana State University on semi-chemical and kraft mill wastes.

The Council's direct mill services were in great demand for individual and collective mill surveys, cooperation with state and federal regulatory

Gee, Mr. Smith... you say the funniest things!

Sec: I never worked for a paper mill before. You use the funniest words! "Railroading!" "Crush!" What do they mean?

Sup: They mean trouble . . . and plenty of it! When the nip squeezes water from a sheet faster than the felt can take it, the water "railroads" back toward the wet end until there's so much water trapped between the felt and the sheet that it "crushes" through the sheet.

Sec: Then "railroading" means water traveling back along the felt . . . . and "crush" means bursting through the paper. Right?

Sup: Young lady, you've said it! And we lick "railroading" and "crush" by using the proper weave and weight of felt for the job.

Sec: How can you be sure it's the proper weave and weight?

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agencies on similar activities, and new mill site evaluation surveys.

The survey of Florida pulp mill waste receiving waters, carried on jointly by the Florida State Board of Health, Florida pulp and paper mills, and the National Council, was completed early in the year. Following this report on the survey was prepared by Mr. David B. Lee, Director of the Bureau of Sanitary Engineering, Florida State Board of Health, and Dr. Harry W. Gehm, Technical Advisor of the National Council for Stream Improvement, and approved by the Florida Pulp and Paper Mill Committee. This report, thanks to the sincere cooperation of all the agencies and mills concerned, has been instrumental in presenting a picture of the Florida pulp and paper industry stream improvement program in its true proportions. While highlighting two pollution problems which exist in the northeastern part of the state and pointing out the remedial measures required to correct them, the report stated ". . . that the pollution problem in Florida with respect to the pulp and paper industry is not of statewide significance, but rather consists of scattered local situations. . . ." Most of the remedial procedures suggested by the report for the various mills have been or are being installed and the industry can view with considerable satisfaction the improved situation which now exists.

In Louisiana the Gaylord Container Corporation, the U. S. Public Health Service, and the National Council jointly cooperated in a survey of this company's mill and its receiving waters. The Public Health Service, as directed by the provisions of U. S. Public Law No. 845, was anxious to make a complete evaluation of the biological and other factors involved in kraft pulping wastes as one of the industrial wastes under investigation and requested the cooperation of the company and the National Council. The survey was completed early in the fall to the complete satisfaction of all concerned.

In addition to the activities above mentioned, Council engineers rendered technical services to a number of individual mills in the region on local pollution problems and were of considerable service to a member mill in the region in selecting a satisfactory site for a new kraft mill which is now under construction in the southeastern section of the region.

Research activities in the region were further developed during the year. The kraft waste project at Louisiana State University has continued and the treatment process developed in the laboratory is now ready for pilot plant adaptation. Several organizational changes have been made in the semichemical project at Virginia Polytechnic Institute on the recommendation of the South Central Project Advisory Sub-Committee. Most important was the appointment of a full-time project leader in the person of Robert E. Opferkuch, Jr., a chemical engineer who was previously employed by the Council at Louisiana State University and also on the Florida survey. The growing interest of pulp producers in many sections in the semichemical process has heightened the interest in the work of this project and increased the necessity for the development of suitable waste treatment methods.

Mobile laboratory employed by U. S. Public Health Service in joint survey with technicians of Gaylord Container Corp and National Council.

Committee activities in the region continued with a meeting of the Southern Regional Group in Jacksonville, Florida in April and the South Central Group in Lynchburg, Virginia in July. The Technical Sub-Committee of the Southern Region and the Project Advisory Sub-Committee of the South Central region, under the chairmanship respectively of Mr. Anthony W. Pesch and Mr. George P. Maniates, held several meetings during the year, at which meetings plans for current and future activities were developed.

Central and Lake States Region

The National Council program in this region is administered by several sub-committees representing practically all pulping and paper making operations and their waste disposal problems. Deinking, strawboard, and papermill white water disposal problems are involved.

The Central States Committee acts as a central agency coordinating all work done in the region. Regulatory officials are invited periodically to the meetings of this Committee for the exchange of information and discussion of aims and purposes. In a recent highly successful meeting, panels comprised of representatives of industry and a National Council representative were selected to discuss the many problems embraced by the area. In this manner both research and field developments were reviewed in a pattern which will probably be followed in future meetings.

Other long-standing committees, set up to study specific problems, extended their work in 1950. These include the Wisconsin Kraft Mills Sub-Committee and the Michigan deinking mills subcommittee. A comprehensive report on known methods of treating kraft mill wastes together with the unit costs involved has been prepared at the suggestion of the Wisconsin Committee by William A. Moggio, of the Louisiana State University Project of the National Council. This committee, through the auspices of the Thilmany Paper Company, has also arranged for a study of the disposal of residual kraft mill wastes into a municipal sewage treatment plant.

The study at the Institute of Paper Chemistry regarding the effect of kraft waste waters on fish and fish food organisms has been continued and extended. This study, while directed mainly by the Wisconsin group, is of interest to the entire kraft industry.

The Michigan sub-committee has been incorporated as a non-profit organization known as the Kalamazoo River Improvement Company. This company, consisting of Allied Paper Mills, Kalamazoo Paper Company, Michigan Paper Company, Rex Paper Company, St. Regis Paper Company, and Watervliet Paper Company is currently operating the recently constructed demonstration plant for the treatment of deinking mill waste by the biological aeration method. This plant was designed by engineers of the Council utilizing data obtained in the Council's laboratory and pilot plant development work. The mid-western engineer for the Council has maintained residence in Kalamazoo to supervise the design, construction, and operation of the demonstration plant. The plant was recently inspected by members of the Michigan Water Resources Commission, which has allowed a one year demonstration period for the accumulation of full-scale operating data. Following this period a committee comprised of representatives of the Water Resources Commission. The Kalamazoo River Improvement Company and the National Council will evaluate the results to determine the overall feasibility of this treatment process.

The services of the Council resident engineer have also been utilized for direct mill service in Ohio, Indiana, Michigan, Wisconsin, and Iowa. In

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Aeration stage of deinking waste treatment plant of Kalamazoo River Improvements Co. being inspected by representatives of Michigan Water Commission and industry personnel.

connection with this service, the Council engineer has collaborated during the last year in the design and supervision of construction of several waste water treatment installations in Ohio, Indiana, and Michigan. Close contact is maintained with many other such projects which are currently in the advanced planning stage.

Close liaison has been maintained with the Miami River Valley Paper Mill group with which tthe National Council has cooperated in an evaluation of the pollution problem on the Miami River. A comprehensive analysis of this river has been completed by Professor Clarence J. Velz at the University of Michigan Stream Analysis Project of the National Council. This report, which has been distributed to all mills concerned, contains several novel diagrams and charts which will be of considerable assistance to the mills and the Ohio State Department of Health in working out a mutually agreeable solution. Considerable mill survey work is planned by Council engineers to further the work in this region.

Early this year, Professor Velz also completed the analysis of the Wabash River which was incorporated into an overall report of the Wabash River Valley Sanitation Commission and represented the National Council's contribution to the cooperative study completed in 1949. The U. S. Public Health Service, the Corps of Engineers, and the Indiana State Board of Health also cooperated in this work.

The pilot plant for the anaerobic decomposition of strawboard waste constructed at the Weston Paper and Manufacturing Company, Terre Haute, Indiana, following development work by the Purdue University Project, continued operation throughout 1950. Plans are being made for the adaptation of this process to modified lagooning in which the sludge would be maintained in suspension by agitation. In this manner steel or concrete structures can be eliminated in favor of earthen basins, considerably reducing construction costs. Recent experience at one of the mills has demonstrated the effectiveness of controlled lagooning for the treatment of strawboard wastes.

West Coast Region

Functions of the National Council in the West Coast region entered a new phase of heightened service activity with the assignment of a Resident Engineer to the area. Oregon State College research projects continued to press for solution of the major paper industry pollution problem of the area, waste sulfite liquor treatment, and to study the relationship between the industry and the important fisheries of the Pacific Northwest. The Council's national program of stream survey and analysis was extended to this region in a comprehensive study of the Willamette River pollution problem in Oregon and a general examination of all affected waterways in the area.

Early in 1950 Mr. Robert P. Logan was assigned as West Coast Regional Engineer with headquarters in Portland. Centrally located with respect to the industry and problems, Mr. Logan is active in the organization of the stream analysis program for the region and stands ready to perform the mill service functions of the Council wherever required. By virtue of having an engineer in residence, closer relationships with the regulatory agencies have been developed and a better mutual understanding of the problems arrived at.

Increasing public interest in stream pollution abatement coupled with a forward looking planning of municipal sewage treatment facilities has made it mandatory that the industry in this region carefully examine its own role in the picture. Of the many problems in the area most pressing was that involving the Willamette River.

Flowing through the most densely populated area of Oregon this river receives the bulk of all industrial and municipal pollution produced in the state. Aware of its own responsibility, the pulp and paper industry requested the Council to organize a survey to obtain a rational and incisive analysis of conditions as they are affected by the industry. An extensive survey was made with all mills involved cooperating and with able assistance and advice from the state regulatory agency and other government agencies. The aid of the Council's Stream Analysis Project at the University of Michigan was enlisted and Professor C. J. Velz, director of the project, visited the area to view the situation first hand and to make recommendations as to the conduct of the survey. Data obtained are now being subjected to rigorous analysis at the University of Michigan and a report will shortly be issued. A clear-cut delineation of the industry's responsibility in the situation and recommendations as to steps necessary to meet state standards for the river will be stressed in the report. A favorable complicating feature of this survey was that one of the mills involved was able to alleviate its pollution during the course of the study. Oregon Pulp and Paper Company constructed and placed in operation a lagoon designed to store the bulk of its waste sulfite liquor during the critical low water stages of the river. A definite improvement in stream conditions was noted as a result of this undertaking.

Although the major effort in stream survey and analysis during the year was in connection with the Willamette, Professor Velz and the resident engineer inspected numerous other potentially troublesome streams and waterways in the area. Accumulation of the basic hydrologic and physical data on these continues in accordance with the Council's established principle of preparation in advance for all possible requests for assistance. This policy has proven its value in planning another survey to be undertaken early this year.

Research activities are geared to problems most critical in the area. The engineering studies under the direction of Dean G. W. Gleeson and the National Council are aimed at solution of one facet of the waste sulfite liquor problem. Although many of the potential solutions to this longstanding

problem are beyond the scope of institutional research it is felt that the heat hydrolysis project at Oregon State College holds promise as a remedy for smaller sulfite mills. Although operating on a very small scale the heat hydrolysis equipment used at Oregon State College has produced encouraging results and the Regional Committee has recommended construction of a larger laboratory pilot plant for continuous operation studies.

A National Council aquatic biology research project at the Yaquina Bay Fish and Game Management Laboratory of Oregon State College is under the direction of Dr. R. E. Dimick. Practical application is being made of the results of this project in a series of field surveys throughout the region designed to determine whether critical concentrations of the toxic components of kraft wastes actually exist in the rivers. Preliminary indications are that high dilution ratios preclude this.

The next year will see an extension of Council mill service and stream survey operations to the State of California. One stream survey in that state has already been definitely planned.

Mr. C. M. Everts of the Oregon State Sanitary Authority, Mr. E. F. Eldridge of the Washington Pollution Control Commission, their assistants, and the representatives of many government agencies have been generous with advice and assistance in many matters pertaining to National Council activities in this area. Their invaluable aid is sincerely appreciated.

Review of Research, Development and Mill Service Activities

A considerable increase in development activities, as compared to laboratory research, occurred in the Council's 1950 program. This was possible through the interest of the industry, regulatory, and other agencies in the results of a number of laboratory investigations which appeared ready for larger scale trial. This trend appears desirable from several viewpoints. It has developed closer working relations between all concerned, a better mutual understanding of the problems involved, and has served to "pin point" future laboratory research along lines most useful in the field. Most important, it has led, in some instances, to the adoption of the treatment and control processes which were developed in the laboratory and the establishment of practice in respect to handling particular wastes.

Ten development projects were in operation last year and arrangements are being completed for three more. Several others have been carried on independently by member companies on problems peculiar to their operations. Kraft mill waste, bleaching waste, rope and rag mill effluents, strawboard waste, deinking waste, white water, and semi-chemical wastes have been involved in this program. Development studies will begin shortly on sulfite waste liquor and new approaches to kraft and bleaching waste treatment problems will be tested on a sizable scale.

Shortcomings of some processes developed in the laboratory were clearly brought out by pilot plant tests. Outstanding among these was bleaching waste treatment. The erratic results obtained indicated the lack of satisfactory control methods; consequently laboratory research has been instituted to establish the necessary technique for control.

The trend has also been toward field investigations for the purpose of supplementing and testing stream analysis procedure and aquatic biology findings in respect to pulp and papermill wastes. Over a dozen comprehensive stream surveys were completed last year. A much larger number of preliminary investigations, involving local pollution problems, new mill locations, and projected production increases or process changes at existing plants were also made. The usefulness of basic information obtained on Council research projects in previous years proved invaluable in appraising survey data and arriving at specific conclusions useful to the industry. Much of this work would have been beyond the physical facilities of the Council without the excellent assistance of government agencies and the mills in supplying personnel, equipment, and information. Cooperation is an absolute essential to studies of this nature because of their complexity.

Participation of the Federal Government in industrial waste research has been accelerated to a considerable degree. In addition to research programs instituted at several universities throughout the country, the United States Public Health Service Laboratory of Environmental Sanitation at Cincinnati is undertaking such programs. Development of analytical methods applying to kraft mill waste is a part of this project and samples are being supplied by the Council's Louisiana State University project in accordance with cooperative arrangements made by the Southern Regional Committee. In the future, projects of this nature will be instituted by the Task Committee on Industrial Wastes organized by the Public Health Service. This group is made up of technical representatives from all major industries and has been charged with the task of inventorying and classifying all research and development projects being conducted on each type of waste. On the basis of this classification, problems not presently under attack will be selected for the attention of the Cincinnati laboratory. The competent scientists of this organization will be of considerable help to the industry, particularly in the development of basic and broadly applicable principles in respect to the analysis of wastes, their behavior in streams, and response to treatment.

Solution of industrial waste problems by treatment together with municipal sewage has been effected in some instances by paper mills. The advisability and success of such combined projects depends upon many factors, both technical and economic. With the basic engineering facts on hand, together with laboratory tests on the efficiency of sewage treatment methods for handling the combined effluents, the economy of this procedure can be readily determined. Pre-treatment of the waste by the industry often produces suitable effluents which otherwise would be unsatisfactory for discharge to a municipal system. Most of the mills employing this method of disposal successfully discharge only machine waters. However, interest has turned to the possibilities of handling the more dilute pulping wastes similarly. The Council's Virginia Polytechnic Institute project is at present completing a study on the effect of semi-chemical wastes on the common sewage treatment process. Similar work has been done on strawboard waste at Purdue University and one mill in the Mid-West is now employing the municipal plant for disposal of this waste.

A useful medium by which research and development results are carried to the membership is the direct mill service activity. Council engineers are now in residence in all regions and stand ready to assist in interpreting the published data as it applies to individual mills or groups thereof, to advise on waste and pollution problems, or to assist directly in any manner the member companies wish. The continuing usefulness of this service was again reflected by an appreciable gain in the number of mill visits and services rendered by the staff.

Perhaps the most outstanding progress made in 1950 was on kraft mill waste treatment. The factors controlling the rate of microbial activity have been determined and means of obtaining high oxidation rates were established. Considerable advance has been made in the study of chemical treatment and although much remains to be done, a clear insight of the basic requirements necessary to evolve a workable process has been obtained. Better means of effluent control have been developed as well as a good evaluation of the effectiveness of new process equipment in reducing effluent strength. Additional data on

the effects of the waste on receiving waters in respect to their use have also been obtained.

While impending defense requirements may of necessity delay to some degree the immediate application of some developments, they may also provide time necessary for more complete trial periods and consolidation of experience. This should result eventually in more efficient application.

University of Michigan

Stream Analysis

Eleven thousand five hundred IBM punch cards, each bearing a coded description of a physical characteristic of the river, were the foundation of the Willamette River, Oregon, study being conducted by the National Council's Stream Analysis Project at the Department of Public Health Statistics, University of Michigan. The physical dimensions of the river at some 300 locations were recorded on these cards. Thousands of river soundings and widths were listed as myriad of tiny, seemingly random punches.

Trained statisticians and engineers guided modern business computing and tabulating machines in reducing this complex mass of data to a clear-cut definition of the physical characteristics of the river as they affect stream pollution. The all important time-of-passage of river water and the exact location of critical sludge deposition areas emerged from a welter of numbers to be used in the next step in the analysis of pollution conditions in the Willamette River.

Records, data, and technical experts of six federal and two state agencies, two municipalities, a university, and five pulp and paper mills were consulted to unearth another mass of seemingly unrelated data of dealing with conditions in the river, sources and size of pollution loads, operation of river developments, and a host of other factors involved in the picture. Hundreds of water samples from an 80-mile stretch of the river were analyzed by field engineers and mill chemists.

Armed with computing machines, slide rules, and the experience of 35 previous surveys, the engineers, statisticians, and hydrologists of the project are interlocking these fragmentary pieces to shape a concise, rational picture of pollution as it is affected by municipal and industrial loads, rainfalls and temperature, tides and dams, and the numerous other elements which go to make up the dynamic sensitive being that is a river. Predictions, the accuracy of which is authenticated by past examples, are being made concerning the effect of proposed pollution abatement procedures.

The foregoing is typical of the approach used by the Stream Analysis Project in its unique service to the industry throughout the country. It is the purpose of this project to answer the following questions:

1.) What is the capacity of the stream, on which a mill is located, to handle pollution?

2.) What is the relative responsibility of the mill for existing conditions of pollution or what will be the effect of a new mill on a given stream?

3.) What degree of improvement in stream conditions may be expected from process modifications, in-plant waste elimination, or treatment and control methods?

Since the inception of this project, rivers in every major paper producing center of the country have been analyzed. During the past year, in addition to the Willamette work, the complex Miami River in Ohio was studied. In the reach analyzed are 17 paper mills, a number of large cities, and 6 dams, all of which were considered in defining the natural purification capacities of the river. Surveys were also made on the Wabash, Ocmulgee, and French Broad Rivers and Manistee Lake. The general program of accumulating background material on all potentially troublesome watersheds involving the paper and pulp industry continues.

For the coming year numerous studies are planned including one involving the relatively new problem of deep tidal water disposal.

Rutgers University

White Water Project

Billions of bacteria report for classes at Rutgers University to unlearn their bad habits and gain skill in the performance of new and useful tasks. Their instructors are the technicians of the National Council's White Water Project. The objectives of their education revolve around the universally troublesome problem of white water treatment and the more specialized question of rag, jute, and rope mill waste treatment. Though specifically concerned with board mills and specialty paper mills the lessons they learn are of general interest to the entire industry.

White water studies of this project continue to investigate the internal problems of white water recirculation and the external problem of the biological treatment of this waste. The first phase of the work is designed to limit the quantities of the waste and the second phase to develop a treatment for the irreducible minimum which remains.

The successful closing-up of white water systems as a means of pollution abatement depends to a great extent on the elimination of bacterial growths which reduce stock freeness and produce slimes. Past work on this project has demonstrated that complete freedom from this problem results from the maintenance of sufficiently high system temperatures. Now it has been shown that the same result may be obtained by the addition of alum sufficient to produce a pH of 5.3 without the necessity of resorting to elevated temperatures.

The bacterial digestion of recirculated white water in the absence of air has been found to reduce pollutional characteristics of the wastes by two-thirds but with relatively large digestor requirements. A number of factors also militate against the activity of the organisms involved in this system.

A combination of preliminary sedimentation of paperboard mill white water followed by ponding for aerobic bacterial purification of the settled waste holds promise of success. Pollutional strength reductions as high as 70 per cent would result from the use of such shallow ponds but large areas would be required. A combination of ponding and some form of intermittent aeration would decrease this area to a more practical measure. Sludge obtained from the preliminary sedimentation in this process lends itself readily to anaerobic bacterial digestion with good organic matter reduction and the production of a concentrated final sludge.

Rope mill waste consisting of the cooking liquor and part of the beater wash water, containing 90 per cent of the organic pollutional matter and three-quarters of the suspended matter produced in the process, has proven amenable to two forms of bacterial purification. This material may be anaerobically digested after neutralization and fortification with nutrient salts. Pollution reductions are high but permissible digester loadings appear too low for economical practice.

Aerobic bacteria, on the other hand, present a more reasonable approach to the problem. These bacteria can be adapted to oxidize rope waste at a high rate. The adapted bacterial sludge is added to the neutralized and nutrient-fortified waste and aerated from 12 to 24 hours. Substantial pollution reductions result which are in line economically with similar proven processes for other wastes. Maintenance of the initial elevated temperature of the waste accelerates the treatment.

In a new phase of the work at Rutgers the oxygen demand of paper fiber sludge banks in rivers is being determined by laboratory methods. This work is desirable in that it will assist in the more accurate analyses of stream pollution problems.

Purdue University

Strawboard Waste Project

Large-scale pilot plant operation, mill-scale lagoon practice studies, and fundamental investigations of the chemical composition of strawboard waste highlighted the activities of the National Council's Strawboard Waste Project at Purdue University. Entering its fifth year of work, the project followed the National Council's trend

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toward emphasis on field development work.

A pilot plant for the anaerobic digestion of strawboard wastes, located at the Weston Paper Company in Terre Haute, Indiana was operated throughout the year. Data on the operation of this process under a wide range of loadings with waste waters produced by various chemical pulping processes were accumulated. With treatment restricted to the more concentrated cooker, beater, and washer wastes an 85 percent reduction of BOD was obtained in a matter of two days. An additional substantial portion of the untreated waste strength is removed by primary treatment. Although pilot plant loadings have not equalled those obtained in the laboratory studies, it is expected that they will as mechanical difficulties are eliminated and better integration with mill operation is obtained. The sludge from this process is vacuum filtered with the aid of coagulants; the possibility of reducing the high chemical demand for this purpose is being studied.

Design factors being established by this work will be invaluable in planning digestion tanks for treatment of this waste and also in designing lagoons for the same purpose. A definite possibility exists of modifying the inexpensive lagoon principle to accomplish results similar to those produced by the more costly steel or concrete digestion tanks.

Lagooning of wastes from the Ball Brothers Company strawboard mill at Noblesville, Indiana continues to be closely observed by personnel of this project. Laboratory studies at Purdue have been useful in explaining certain operating anomalies observed in the operation of this lagoon.

Studies of the constituents of strawboard wastes have shown that pentosans, lignin, and volatile acids are among the more significant organic compounds from the standpoint of stream pollution. Although they contribute nearly 40 percent of the BOD, the initial oxidation rate of the pentosans is very low. The volatile constituents, on the other hand, account for only 22 percent of the oxygen demand but are rapidly oxidized; 70 percent of their oxygen demand is satisfied the first day. Methods to eliminate the initial lag in pentosan decomposition will materially shorten the time required for strawboard waste purification. Lignin contributes but slightly to the total oxygen demand but does have a high chlorine demand. This latter characteristic is of importance where the treated waste is discharged to streams which serve as source of municipal water supply.

Pilot plant studies will continue to aim at greater economy in strawboard waste treatment. Efforts will be made to determine whether the addition of small amounts of supplemental nitrogen will reduce digester size requirements. Further studies will establish the most suitable method of handling the sludge produced in the treatment of strawboard waste. Additional laboratory studies regarding the organic constituents will assist in anticipating requirements at various mills.

Institute of Paper Chemistry Oregon State College

Aquatic Biology Project

Lively salmon from the rivers of the Pacific Northwest and lazy bluegills from the waters of Wisconsin aided aquatic biologists of Oregon State College and the Institute of Paper Chemistry during the past year in their studies to extend the knowledge concerning the effect of pulp and paper mill effluents on fish life.

Nearly ten thousand wild king salmon, silver salmon, cutthroat trout, and steelhead trout have been processed at Oregon State College to establish the toxic effect of kraft mill waste components on these important fish of the Northwest. With the completion of laboratory studies on the effects of the pure salts and organic compounds encountered in the waste, the work is now proceeding along two lines. The earlier laboratory tests indicated the deficiencies in the usual bio-assay techniques employed in this type of investigation. Aquaria utilized in these tests represent a severely static and unnatural environment for such fish as salmon and trout. To obtain a more realistic approach to the testing of these fish a continuously flowing stream of mountain water now courses through artificial stream beds at the Oregon State College Yaquina Bay experiment station. Transplanted silt and gravel bottoms, in which grow aquatic plants and organisms of the type encountered by the fish in their normal habitat, provide as close a simulation of natural environmental conditions as has ever been attained in this work. Small wild salmon have been found to thrive under these conditions. Accurate chemical feed pumps dose the flowing water with concentrations of kraft waste similar to those found below West Coast mills.

It is hoped that this reproduction of natural streams will throw new light on the kraft effluent problem and that a correlation between the reactions of fish in the stream and those in aquaria may be established. To date indications from the artificial streams are that for salmon the potentially toxic effects of kraft effluents may not be as pronounced as those encountered in the previous test aquaria.

In the second study at Oregon State College technicians are detemining the amounts of the various components of kraft mill wastes actually encountered in rivers below the points of mill discharge. An attempt will be made to correlate the results of bio-assays with actual field conditions to establish the true degree of pollution, if any, from mills in that area.

The project at the Institute of Paper Chemistry covers another phase of the industry-wide problem of toxicity. Allegations have been made that some of the toxic effects of pulp mill wastes toward fish are insidious and manifest themselves only after long periods of time. It has been claimed that the cumulative effects of kraft mill wastes are such that the fish gills are corroded and liver and kidney tissues destroyed. To confirm or disprove this claim pathological investigations are being conducted. Fish are being subjected to sub-lethal concentrations of the waste for long periods and then killed; gross effects are observed and microscopic examinations of tissue sections from the affected organs made. Results to date do not substantiate the contention that kraft wastes are cumulative in effect.

The methods for precise analysis of the toxic components of kraft wastes devised at the Institute have been widely used in the field by National Council engineers and others engaged in survey work. The rough but useful correlation between kraft effluent pH and conductivity and its content of potentially toxic material and BOD has proven of definite value for control purposes.

In their efforts to establish the relationship between pulp and paper

Flow measurement being made on a southern river by U. S. Public Health Service and National Council Engineers.

wastes and aquatic life, the personnel of both projects have been required to develop entirely new investigative techniques. These efforts will be of value to the industry generally as they will provide ready and proven tools to attack any problem of toxicity.

In the past year both projects have been called upon for assistance in specific problems involving individual mills. Thus, in addition to conducting the needed research, the National Council and the project personnel are in a position to render direct service to mills involved in problems of aquatic biology.

During the next year both projects will pursue the fundamental objectives of determining the effects of pulp and paper mill wastes on fish, other aquatic forms, and stream environment. Oregon State College will continue its artificial stream and field studies and begin investigations on the effects of sulfite waste liquor. The Institute of Paper Chemistry will carry its kraft waste investigations to the ultimate in its pathological investigations.

Louisiana State University

Kraft Mill Waste Treatment

Large gum-like bacterial colonies of the genus Pseudomonos in union with a small tan organism called Flavobacterium work together to reduce the pollutional strength of kraft waste by nine-tenths in a matter of hours in another demonstration of bacterial action harnessed to the task of eliminating stream pollution.

The development of this complete biological treatment method and a shifting of emphasis to research in chemical methods marked the fourth complete year of kraft mill waste investigations at Louisiana State University under the direction of William A. Moggio, National Council Resident Engineer for the Southern Region. The purposes of this program were to investigate basic mechanisms of the biological treatment of kraft waste, to develop means for accelerating the stabilization of the mill effluents, and to study the chemical treatment of this troublesome waste.

Initial inquiries into the problem were concerned with the ponding method of waste treatment. These studies established that stabilization occurred largely as a result of biological rather than chemical oxidation. Seed organisms, nitrogen and phosphorous compounds, optimum pH conditions, proper waste dilution, and an aerobic environment, all served to accelerate the rate of waste stabilization.

Knowledge gained from these studies served as a basis for an accelerated treatment process. With suitable manipulations of conditions, a 90 percent BOD reduction was obtained in four to six hours. Domestic sewage was shown to be ideal as a source of seed organisms as well as the necessary nutrient salts. Relative to these observations, it has been noted that kraft effluents undergo accelerated stabilization in streams polluted with domestic sewage. This phenomenon was examined for additional clues to the solution of the problem. The principles uncovered in these various investigations have been embodied in a pilot plant design which is now under consideration by members of the Southern Region.

Because of the increasing importance being attached to the removal of color from kraft mill effluents, a new emphasis has been placed on chemical treatment research. Color is not removed biologically but is amenable to a number of the chemical methods. However, the technical success of methods employing these chemicals depends on solution of the problems of handling and dewatering the gelatinous sludges and the economic success depends on possibilities of chemical recovery.

Preliminary tests at one mill indicate that hydrated lime offers the most promising possibilities; removal of 90 percent of color and 30-50 percent of BOD were obtained. Successful and economical dewatering and calcination of the lime-organic sludge remains the crux for further investigation. A bibliography covering all aspects of this phase is being prepared.

During the past year project personnel have been active in direct mill service and in planning and execution of kraft mill waste and stream surveys. A number of the stream surveys were made in cooperation with state regulatory agencies and the U. S. Public Health Service.

The coming year will see a continuation of the direct mill service and field survey work and detailed investigations into chemical treatment for color and pollution removal from kraft effluents.

Kalamazoo College

Deinking Mill Waste

Extending geographically from Massachusetts to Michigan and technically from laboratory bench experiments to a full-scale demonstration plant the National Council's deinking waste project covers every aspect of the treatment of this waste. Processes designed to accomplish three degrees of treatment are being studied by this project. In the Fitchburg, Massachusetts area laboratory and pilot plant investigations of purification by plain sedimentation and chemical treatment of this waste are being conducted. From the project center at Kalamazoo College the design, supervision of construction, and operation of a full-scale demonstration biological aeration plant continue under the direction of the National Council Resident Engineer.

At Fitchburg two full-scale primary treatment plants are in operation and under study by a Council engineer; one, designed by the National Council is at the Falulah Paper Company and the other is at the Crocker, Burbank and Company Association mill.

The intermediate degree of treatment of deinking wastes is being investigated at a 22,000 gallon per day pilot plant at Fitchburg. This degree of treatment involves plain sedimentation and chemical coagulation, a process developed following preliminary laboratory work. The most effective coagulants appear to be magnesium salts and several of these have been tested. Results to date indicate that removal of 80 to 95 percent of suspended solids and 35 to 40 percent of the BOD may be expected. This compares with corresponding removals by plain sedimentation of 60 and 20 to 25 per cent respectively. Easily filterable sludges of 10 per cent consistency were obtained. Combined treatment of deinking waste and white water showed no advantage and efforts in this direction have been abandoned. Chemical treatment has been tested at one of the full-scale primary treatment plants and its adaptability is indicated.

Comparative runs between the pilot plant at Fitchburg and a commercial unit employing chemical coagulation and flotation were made. Similar efficiencies of purification were noted with both units when equal chemical dosages were used; in the absence of chemicals the pilot plant gave better results.

Tabulating machines and personnel employed in stream analysis calculations at National Council's University of Michigan project.

At Kalamazoo the full-scale demonstration biological aeration plant consists of a primary settling tank, aeration tank, secondary settling tank, and sludge concentration tank. Designed for wide variations of flow and detention time the plant is almost entirely automatic in operation and requires only one man for control and maintenance.

Steps in the process employed at this plant include initial removal of settleable material in the primary tank, aeration of the waste with an active biological sludge, and removal of the active sludge in the secondary settling tank. The biological sludge is returned in part to the aeration tank; the remainder is drawn off to disposal on sludge drying beds or to other means of dewatering.

Foremost technical problems remaining to be solved are concerned with the aeration stage and with sludge dewatering and disposal. Various types of commercial aeration equipment are being studied and an effort is being made to reduce the aeration period required for treatment. Sludge dewatering by numerous methods will be studied and possible disposal of the dried sludge in the agricultural field will be explored. The basic problems of reducing operation costs and integration of the treatment process with mill operations remain to be completely solved.

Virginia Polytechnic Institute

Semi-Chemical Wastes

Examining their problem from every angle, a group of engineers at Virginia Polytechnic Institute came to a surprising conclusion: the problem may be its own solution. The question was to arrive at an answer to the perplexing problem of how to avoid the untoward consequences of bacterial action which often occur in streams receiving semi-chemical wastes. The solution appears to rest in putting this same bacterial action to work in a separate waste treatment procedure.

Rapidly increasing interest in semi-chemical pulping operations has been matched at the National Council's Semi-Chemical Waste Project at Virginia Polytechnic Institute by an accelerated program investigating the wastes from these processes. The attack on the problems involved is along two approaches. First, a separate treatment procedure is being developed, and second, the possibility of treating this waste with municipal sewage is being evaluated.

As with many other organic wastes, the most promising method of treatment appears to be a controlled acceleration of the same bacterial mechanisms which give rise to difficulties in rivers and streams. In this case the procedure is anaerobic digestion to which the waste appears to be quite amenable. Preliminary indications are that semi-chemical effluents are similar, in response to digestion, to other organic wastes which have been successfully and economically treated in this manner. The essential amounts of nutrient materials which must be added to promote biological activity have been determined and it has been established that mechanical agitation will greatly increase the speed of reaction. The problem of high detrimental organic acid production, which is inherent with this waste, remains to be solved, and permissible digester loadings must be determined more exactly. A laboratory size pilot plant has been constructed to facilitate this research.

In the second phase of the work at Virginia Polytechnic Institute a critical appraisal of the possibility of treating semi-chemical waste at municipal sewage treatment plants was made. There are a number of cases where mills of this type are located in or near large cities. However, the recommendations that these pulp wastes be discharged to the municipal sewers may be made only if it can be demonstrated that no undue difficulties in the treatment of the sewage will result.

This study covered the effects of semi-chemical wastes on primary sedimentation of sewage and on the treatment of sludge resulting from this fundamental operation of sewage treatment. Also investigated was the influence of the waste on chemical flocculation of sewage and on the chlorination of sewage for disinfection.

When the amount of total mill waste was 8 per cent of the sewage volume no difficulty was experienced with the basic operation of sedimentation for suspended solids and biochemical oxygen demand removal. The resulting sludge was not materially increased in volume nor was its digestion hindered. Only a slight increase in amounts of chemicals required for flocculation was noted but the chlorine demand for disinfection was materially increased.

Semi-chemical blowdown liquor, in amounts up to 25 per cent by volume, in the sewage would have no appreciable effect on a primary treatment sewage plant.

Oregon State College
Bates College

Waste Sulfite Liquor

Sixty years of research on the part of industries and universities throughout the world have resulted in dozens of processes and thousands of patents but no universally satisfactory process for the solution of the waste sulfite liquor problem. There has yet to appear an economical and technically sound process for the abatement of waste sulfite liquor pollution which is applicable to all mills, large and small.

In recent years interest has centered around the biological treatment method, the fermentation processes, by-product recovery methods, the ameliorating techniques of stream aeration and lagooning, the fundamental operation of process changes, and more recently, heat hydrolysis.

Though technically feasible, the biological treatment procedures are economically prohibitive, requiring installations which would rival the mill itself in both cost and size. The National Council has been instrumental in developing a number of these methods.

Two fermentation processes are actually in use today. Both alcohol and yeast are being produced but neither process produces a universally satisfactory reduction of BOD, and more important, economic conditions and competitive products are such that these methods can find application only in isolated instances. The production of fodder yeast and molds was thoroughly investigated by National Council projects without encouraging results.

Waste sulfite liquor evaporation without by-product recovery is fundamentally uneconomical. Markets for the possible by-products are rarely able to absorb more than a fraction of the liquor. The Howard Process is limited in application for the same reason.

The use of lagoons or the National Council developed stream aeration process is satisfactory where applicable but, again, the instances where they may be used are not numerous.

Great interest has been shown in this country in the uses of different bases which permit chemical or heat recovery and which result in almost complete abatement of pollution. These processes are being investigated in large, mill-scale operations by the industry and show great promise. However, they are yet to be thoroughly proven and their inherent high capital costs and minimum size limitations militate against their use by smaller mills.

The heat hydrolysis method being developed at Oregon State College involves heating the liquor to high temperatures under pressure. Sugars, the major source of difficulty in rivers, are hydrolized to gas and water; liquors and other substances are precipitated in an easily filterable form. Though still in an embryonic stage, it is hoped that this method will evolve into a satisfactory treatment process, economical to build and operate, and especially suited to smaller mills.

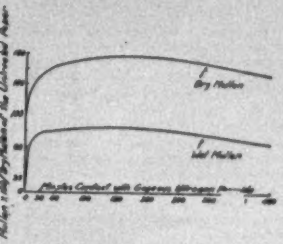
Present activity at Oregon State College is centered around the construction of a larger laboratory size pilot plant capable of sustained operation. This will permit verification of the apparently optimum reaction conditions of 450-460°F. and 40-60 minutes retention under pressure which have been established to date. Admission of high pressure air as an aid to the reaction and the response of different liquors to the process will also be studied.

At Bates College research directed toward determining the cause of odor production in rivers receiving waste sulfite liquor revealed that a certain nutrient balance is required by the responsible organisms. The presence of reducing sugars appears to be requisite to the production of odors. Fundamental studies on the BOD satisfaction mechanisms in rivers containing sulfite waste liquor continue on this project.

Patent Abstracts

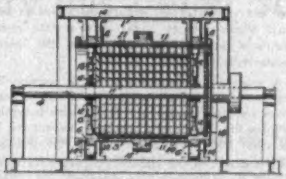
● *In addition to abstracts on the technology of pulp, paper and related industries, miscellaneous abstracts which may provide useful information are included.*

U.S. 2,536,285 — Process of Making High Wet Strength Paper. Herman C. N. Heckel, Oxford, and Arthur C. Salisbury, Hamilton, Ohio, assignors to The Champion Paper and Fibre Company, Hamilton, Ohio. Filed July 25, 1946 — Issued January 2, 1951.



Process of imparting wet strength properties to paper which comprises exposing a web or sheet of paper to nitrogen peroxide and then treating the paper with an excess of water to produce partial gelatinization of the surface of the fibers and limiting the time of exposure of the paper to the nitrogen peroxide in relation to the concentration of nitrogen peroxide used, to a degree such that the carboxyl content of the cellulose in the paper is less than 1% and the nitrogen content of the cellulose is less than 0.2%.

U.S. 2,536,332 — Apparatus for Refining Fibrous Materials. Henri Léon Xavier Vincent, Malines, Belgium. Filed October 20, 1947 — Issued January 2, 1951.



Apparatus for the treatment without tearing of pulp fibers comprising, a cylinder rotatable about its axis and having a smooth cylindrical inner surface, a plurality of rollers mounted within the cylinder for rotation and provided along their entire active lengths with a plurality of circumferentially extending equally spaced grooves all of which are of equal depth, projecting ribs on said rollers intermediate the grooves, the outer surface of said projecting ribs being of equal height and being arranged substantially perpendicular to the axis of said rollers, serrations carried by the peripheral portions of said ribs, and the width of said grooves measured axially of the rollers being approximately three times the width of the projecting ribs, and means for holding the rollers at a fixed distance from each other adjacent the inner surface of the cylinder.

U.S. 2,536,446 — Suction Box for Traveling Screen Filters. Irving C. Jennings, South Norwalk, Conn. Filed February 2, 1946 — Issued January 2, 1951.

In a traveling screen filter, a suction box including a series of closely spaced small diameter rollers on which the screen wire runs, and a sealing member cooperating with a terminal roller of the series, said sealing member being composed of segments arranged end to end, each segment having a face conforming generally to the contour of a wide sector of the roller and having a series of longitudinally extending parallel channels in said face terminating short of the ends of the segment, the box including side walls having an upper longitudinal section carrying said sealing members, said section and sealing members being movable toward and from said terminal roller and adjusting means for shifting said movable wall section and sealing member to provide a desired clearance between the sealing member and the terminal roller.

U.S. 2,536,656 — Method of Waterproofing Paper Textile Fabrics. John J. Petroske, Methuen, Mass., assignor to Patchogue-Plymouth Mills Corporation, New York, N.Y. Filed July 13, 1945 — Issued January 2, 1951.

The method of waterproofing a textile fabric which is normally innocuous to lacquer, which includes the steps of applying a brush coating of a waterproofing agent containing aluminum acetate in a wax emulsion to one side of the fabric only, brushing the damp and dry sides of the fabric, arresting impregnation of the fabric by the waterproofing agent by drying the fabric in the presence of heat before complete impregnation takes place, spraying the untreated side of the dried fabric with lacquer under pressure, and allowing the lacquer coating to dry and form a flexible, transparent, glossy coating upon the fabric.

U.S. 2,536,675 — Method and Means of Making Bags. Samuel Bergstein, Cincinnati, Ohio, assignor to Robert Morris Bergstein and Frank David Bergstein, trustees. Filed May 7, 1945 — Issued January 2, 1951.

A process forming, from thin, flexible materials, two-piece bags closable at one or both ends by heat sealing which comprises withdrawing bag forming material from a web supply, forming by continuous coating means stripes of thermoplastic adhesive adjacent each longitudinal edge of the material so withdrawn, causing said stripes to set and become non-adhesive, severing the striped material into sheets, continuously moving said sheets in a direction at a right angle to the path of travel of the bulk supply, withdrawing other material from a second bulk supply parallel to the first supply and forming by continuous coating operations longitudinal stripes of thermoplastic adhesive adjacent each lateral edge thereof, severing said second bulk material into sheets of shorter length than the first mentioned sheets, correlating the first mentioned sheets and the second mentioned sheets in superposed position with the second mentioned sheets terminating inwardly of the edges of the first mentioned sheets, and with the adhesive areas of both sheets lying therebetween and next each other, applying adhesive by a continuous coating operation to the projecting side edges of the first mentioned sheets, folding said edges over onto edge portions of the second mentioned sheets, and forming longitudinal seams by heat sealing.

U.S. 2,536,988 — Flame Resistant and Mildew Resistant Composition for Cellulose Fibers and Fabrics. Richard D. Vartanian, Bound Brook, N.J., assignor to American Cyanamid Company, New York, N.Y. Filed December 7, 1949 — Issued January 2, 1951.

A stable heterogeneous oil-in-water type emulsion, adapted for the simultaneous deposition on fabrics of mildew-proofing, fire-resisting, afterglow-preventing, coloring and binding materials from an aqueous medium, which emulsion is comprised of a continuous dispersion medium comprising water containing 0.1-10% by weight of a hydrophilic colloid and 1-5% of a water-soluble phosphate afterglow preventative; a dispersed phase comprising 5-30% of film-forming substantially colorless water-insoluble non-volatile chlorinated organic compound containing 2-12% by weight of the emulsion of combined chlorine and capable of liberating HCl at elevated temperatures, 6-15% of a colorless, fire-retarding pigment, and an organic solvent; a separately dispersed phase comprising an organic solvent, 0.5-10% of an uncured, heat-convertible, resin binder selected from the group consisting of (a) the drying-oil-modified alkyd resins, (b) organic-solvent-soluble amide-aldehyde resins, and (c) mixtures thereof, and at least one coloring pigment; 0.25-4.0% of a water-soluble soap of a fatty acid; and 0.2-2% of a halogenated phenol mildew-proofing agent dissolved in a water-soluble sulfonated oil, the percentages given being percent by weight of the total emulsion.

U.S. 2,536,990 — Folding Box. Marshall I. Williamson, New Haven, Conn., assignor to National Folding Box Company, Inc., New Haven, Conn. Filed January 29, 1948 — Issued January 2, 1951.

A folding box made from a tubular blank of foldable sheet material and comprising, an upper main panel; a lower main panel; side wall forming panels adapted to be folded face to face to form side walls, at least partially of double thickness, said side wall forming panels being hingedly connected to said main panels along the sides of said main panels; end wall forming panels adapted to be folded face to face to form an end wall, at least partially of double thickness, said end wall forming panels being hingedly connected to at least one of said main panels along its end edge; first flaps hingedly extending from the inner thickness of said end wall forming panels, said tuck flaps being insertable between the two thicknesses of said side walls by folding of the end wall panels about said end edge, the maximum radial dimension of said first flaps measured from the intersection of said end edge with the hinge line of the respective first flaps being less than the height of the side wall above said intersection, considering the box in assembled position; and second flaps hingedly extending from the outer thickness of said side wall forming panels, said second flaps being foldable into face-to-face position with said end wall forming panels.

U.S. 2,537,114 — Pigment Coated Paper. Arthur E. Young and Elmer K. Stilbert, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich. Filed February 26, 1948 — Issued January 9, 1951.

A printing paper having a coating consisting of an intimate mixture of from 8 to 30 parts of adhesive material and 100 parts of mineral pigment, said adhesive material consisting of a size selected from the group consisting of casein, starch, and soya protein, and from 0.333 to 3 parts of a copolymer, of from 30 to 50 per cent butadiene and 70 to 50 per cent styrene, per part of the size.

Can. 470,237—Synthetic Resins from Phenols and Lignocellulosic Materials. Thoms Robert McElhinney, Lockport, Louisiana, U.S.A., assignor, by mesne assignments, to Valite Corporation, New Orleans, Louisiana, U.S.A. Filed December 11, 1945 — Issued December 19, 1950.

A process of making a synthetic novolak type of resin of a type similar to phenol-aldehyde resins which comprises, reacting phenol with a ligno-cellulose material in the presence of a small amount of concentrated sulphuric acid approximately 5 per cent by weight of the said lignocellulose material and live steam at approximately 225 lb. per square inch for a period of approximately 30 minutes, and washing and drying the resulting product.

The product produced by the process of claim 1.

A process of making a synthetic resin of a type similar to phenol-aldehyde resins which comprises reacting phenol with a ligno-cellulose material in the presence of a small amount of concentrated sulphuric acid and steam at approximately 225 lb. per square inch of pressure.

In the process of making a synthetic resin of the type similar to the phenol-aldehyde resins, the steps of liberating aldehydes and ketones from ligno-cellulosic material by heating said ligno-cellulosic material with substantially five per cent of its weight of concentrated sulphuric acid in the presence of live steam under pressure of substantially 225 lb. per square inch, and simultaneously reacting said liberated aldehydes and ketones with phenol subject to the same conditions of temperature and pressure as said aldehydes and ketones to form a resin.

Can. 470,239 — Felt Conditioners for Use in Papermaking. Frederick William Vickery, Guildford, Surrey, England, assignor to Vickerys Limited, London, England. Filed November 8, 1948 — Issued December 19, 1950.

470239

A felt conditioner shoe, comprising a body, a plate removably connected to the shoe and serving to contact the felt, said plate being formed with slots and with holes for subjecting the felt to vacuum, and nozzles detachably mounted in said slots and serving to supply cleaning fluid to the felt.

A felt conditioner shoe as claimed in claim 2, characterized in that the washers are integral with the nozzles.

A felt conditioner shoe as claimed in claim 3, characterized in that the nozzles are of rubber or other resilient material and in that the washers are constituted by projecting shoulders formed on the nozzles.

A felt conditioner shoe as claimed in claim 1, characterized in that the nozzles increase progressively in width from the face of the plate secured to the shoe body to the felt-contacting face of the plate and by the provision of clearing fingers which are operable to dislodge obstructing matter from the narrow portions of the nozzles.

Can. 470,288—Foam Reducers. Miles Lowell Edwards, Longview, Washington, U.S.A. Filed March 31, 1945 — Issued December 26, 1950.

A device for reducing foam comprising a wall defining a chamber, means for rotating said chamber, fan blades rotatable with said chamber for inducing a flow of foam into said chamber, means mounted in said chamber and rotatable therewith for inducing coincidental rotation of said foam and said chamber whereby the liquid component of said foam is made sufficiently heavy by centrifugal force to crush the foam bubbles, means defining an outlet from said chamber for the gaseous component of said foam, and means defining an outlet from said chamber for the liquid residue of said foam.

A device for reducing foam comprising a wall defining a chamber, means for rotating said chamber, centrifugal fan blades rotatable with said chamber for inducing a flow of foam into said chamber, transverse baffle means mounted in said chamber and extending outwardly from the axial center thereof for directing said foam into the area of maximum rotational velocity in said chamber, means mounted in said chamber and rotatable therewith for inducing a coincidental rotation of said foam and said chamber for producing centrifugal separation of the constituent parts of said foam, means defining an outlet from said chamber for the gaseous component of said foam, and means defining an outlet from said chamber for the liquid residue of said foam.

Can. 470,321—Processes of Reducing Corrosion and Compositions of Reduced Corrsiveness. Eugene D. Crittenden, Petersburg, Virginia, U.S.A., assignor, by mesne assignments, to Allied Chemical & Dye Corporation, New York, New York, U.S.A. Filed September 15, 1945 — Issued December 26, 1950.

The process of reducing corrosion at atmospheric temperatures of ferrous metals by an aqueous solution of ammonium nitrate and urea which comprises incorporating in said solution a small amount of free ammonia which is only a fraction of a per cent by weight of the solution and which decreases the corrosiveness of the solution at atmospheric temperatures towards a ferrous metal to less than that of a neutral solution of the same ammonium nitrate and urea content and contacting said solution with said ferrous metal at said temperatures.

As a new composition of matter suitable for storage, transportation and use in contact with ferrous metals at atmospheric temperatures an aqueous solution of ammonium nitrate and urea containing a small amount of free ammonia which is only a fraction of a per cent by weight of the solution and which decreases the corrosiveness of the solution at atmospheric temperatures towards ferrous metals to less than that of a neutral solution of the same ammonium nitrate and urea content.

Can. 470,350—Methods and Apparatus for Changing Coating Solutions of Coating Machines. Leon P. Morey, Rochester, New York, U.S.A., assignor to Canadian Kodak Company, Ltd., Toronto, Ontario, Canada. Filed June 13, 1946 — Issued December 26, 1950.

In a web coating apparatus the combination of a pair of coating pans adapted to contain a supply of coating solution and each movable between a common coating position and a ready position, and means for rapidly and simultaneously moving one of said pans from the coating position to its ready position while moving the other pan from its ready position to the coating position without causing an agitation of the liquid level of the solution in the pan moving into coating position sufficient to affect the quality of the coating applied to the web.

A coating apparatus according to claim 1 in which the ready position of each pan is to one side of and below the coating position, an inclined track guiding each pan between its ready position and the coating position, a roller associated with each pan to move therewith and engaging corresponding ones of said tracks, the upper end of each track terminating in a portion which is vertical, whereby the final increment of motion of the pans before coming to rest in the coating position is vertical to assist in preventing agitation of the liquid level of the solution in the pans.

Can. 470,353—Rapid-Wetting Bentonite-Calcium Sulphate Backfills for Cathodic Protection. Clarence A. Pippin, Wallis R. Bennett and Melvin O. Robinson, Midland, Michigan, U.S.A., assignors to The Dow Chemical Company, Midland, Michigan, U.S.A. Filed January 24, 1949 — Issued December 26, 1950.

The method of forming a rapid-wetting backfill for use in cathodic protection which comprises blending together finely divided bentonite, finely-divided calcium sulphate, and water, and thereafter drying the blend at a temperature above 100° C.

The method of making a rapid-wetting briquetted backfill for use in cathodic protection which comprises blending together one part of bentonite, from 0.25 to 4 parts of calcium sulphate, and water in a proportion sufficient to form a briquettable mass, briquetting the latter, and drying the briquettes at a temperature above 100° C.

A packaged anode for use in cathodic protection system comprising a water-permeable container having therein a magnesium metal anode provided with means for connecting an electrical conductor thereto, such anode being surrounded by and in intimate contact with a backfill prepared according to the process of claim 1.

Can. 470,401 — Vinyl Resin Dispersions. William H. Bromley, Jr., Agawam, Massachusetts, U.S.A., assignor to Shawinigan Resins Corporation, Springfield, Massachusetts, U.S.A. Filed April 16, 1948 — Issued December 26, 1950.

A process as defined in claim 7 in which the polyvinyl butyral resin contains, on a weight basis, 5-25 per cent hydroxyl groups calculated as polyvinyl alcohol, up to 3 per cent acetate groups calculated as polyvinyl acetate and the balance substantially butyraldehyde acetal.

A process for preparing a stable aqueous dispersion of polyvinyl butyral resin which comprises reacting a polyvinyl alcohol with butyraldehyde in the presence of a volatile solvent for the polyvinyl butyral, a plasticizer for the polyvinyl butyral, a strong acid catalyst and an organic acid capable of forming a soap, adjusting the volatile solvent content of the resulting product so that not over 10 parts by weight of solvent are present for every 100 parts by weight of polyvinyl butyral and neutralizing the resulting product with an aqueous solution of a strong base to form a dispersion of water in plasticized polyvinyl butyral and finally adding sufficient water to cause the water-in-resin dispersion to invert to a dispersion of resin-in-water, said polyvinyl butyral containing, on a weight basis, not over 30 per cent ester groups calculated as polyvinyl ester, not over 30 per cent hydroxyl groups calculated as polyvinyl alcohol and the balance substantially butyraldehyde acetal, the initial reaction mixture containing at least 5 per cent volatile solvent by weight and 5-80 per cent plasticizer by weight based on the resulting polyvinyl butyral, sufficient organic acid in the range 0.5-30 parts by weight for every 100 parts by weight of polyvinyl butyral so that on neutralization there is sufficient salt thereof to cause the initial water-in-resin dispersion to invert to a resin-in-water dispersion on addition of water and not more than 2 per cent by weight strong acid catalyst calculated as sulphuric acid based on the polyvinyl alcohol content.

News about

B. F. Goodrich Chemical Company

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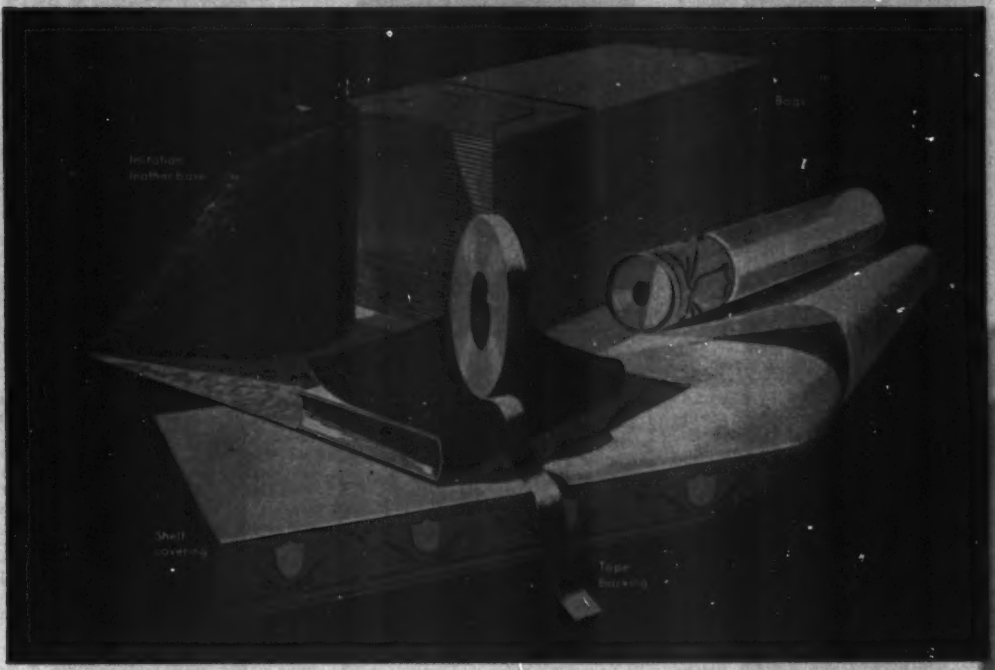

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SUPPLIERS

ALUMINUM CO. OF AMERICA, as part of its effort to make more aluminum available for America's defense and civilian needs, will build a new alumina plant near Bauxite, Ark. According to a recent announcement, construction of the new plant is to begin immediately.

Designed to process low-grade bauxite ore, the new plant will increase by nearly 50 percent the amount of alumina now being produced by the company. Alumina is the refined ore from which basic aluminum is obtained by the smelting process.

BARRETT-CRAVENS CO. announces its merger with the Crescent Truck Co., Lebanon, Pa., manufacturers of electric industrial trucks and tractors since 1917. The Cresecent Truck Co. will be operated as a division of Barrett-Cravens Co.

All sales will be conducted from the general office of Barrett-Cravens Co. at 4609 S. Western Blvd., Chicago, Ill. Engineering and manufacturing operations will be continued at Lebanon. No major changes in personnel are contemplated at this time.

BLACK-CLAWSON advises that all inquiries relative to Kohler unwinding and winding equipment should be sent direct to the Dilts Division of The Black-Clawson Co., Fulton, N. Y. This directive is prompted by the retirement of Franklin W. Kohler, former sales and engineering representative, from the Black-Clawson Co. John B. Kohler will continue as consultant for Black-Clawson Co. with special emphasis on the Kohler System and on the Dilts converting line, with headquarters at Fulton.

CONOFLOW CORP., manufacturers of pneumatic control accessory equipment, Philadelphia, announces the appointment of J. R. Simpson & Co., 200 South Michigan avenue, Chicago, as Conoflow representatives. In addition to the Chicago area, J. R. Simpson & Co., headed by J. Robert Simpson, Jr., will operate in Illinois, Indiana, and Wisconsin. Mr. Simpson will be engaged in the application, engineering, and selling of Conoflow control equipment to the process and heavy industries.

HOWE SCALE CO., Rutland, Vt., has appointed George A. Seaver as manager of the New York City branch and William H. Leland as manager of the Newark, N. J., branch.

Mr. Seaver resigned as president of the Roberts Numbering Machine Co., Brooklyn, N. Y., in order to take over the New York City post with Howe. He has a mechanical, sales, and managerial background.

Mr. Leland has been active with the New York City and Newark branches of the Howe Scale Co. for several years.

HOOKER ELECTROCHEMICAL CO., Niagara Falls, N. Y., elected Edwin R. Bartlett (seated) to chairman of the board of directors. R. Lindley Murray (standing) was at the same time promoted to the office of president of the company.

Mr. Bartlett has been associated with the Hooker Co. since 1907 in various capacities having been made a vice-president and director in 1924. He has been president of the firm since 1945. He is an officer of several other companies, being both president and a director of Hooker-Detrex, Inc., a subsidiary of the Hooker Co. Mr. Bartlett is a member of several technical and professional societies including American Chemical Society, American Society for the Advancement of Science, American Ordnance Assn., and the Engineering Society of Buffalo.

Mr. Murray has been with Hooker since 1916. He has been a director since 1937 and is a vice-president and director of Hooker-Detrex. Among technical associations in which Mr. Murray is active are: American Chemical Society, American Institute of Chemical Engineering, Society of the Chemical Industry, Electrochemical Society, and he is a member of the Panel of Arbiters of the American Arbitration Society.

MONSANTO CHEMICAL CO. announces that J. G. MacDermot, Vancouver, B. C., has been moved to St. Louis, Mo., to assume the post of assistant director of the company's foreign department. Mr. MacDermot is now manager of western operations for Monsanto (Canada) Limited, with headquarters in Vancouver.

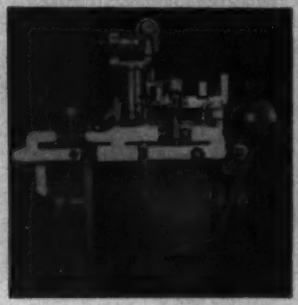
He will remain a member of the board of directors of this company, but will resign his post as vice-president of the Canadian company before assuming his new duties March 1.

Mr. MacDermot was employed by I. F. Laucks Ltd. in 1939. The Laucks organization was acquired by Monsanto in 1944 and merged with its Canadian subsidiary in 1948.

CHAS. T. MAIN, INC., announces that Arthur L. de Spain, formerly project engineer, Brown Co., Berlin, N.H., has joined their organization as a project engineer in their Pulp and Paper Division.

ROSIN SIZE EMULSIFIER

A new, simplified, automatic emulsifier for rosin size has been announced by Hercules Powder Co. The new automatic emulsifier is lower in price than the original emulsifying unit introduced by Hercules in 1948, and is designed to meet the need for a more economical and simplified unit.



A spokesman for Hercules reports the price for the new unit will be under $3,000.

The automatic emulsification of rosin size was pioneered and introduced by Hercules in 1948. It was the first process of its kind made available to the paper industry.

The new, simplified, and fully assembled emulsifier is the result of several years of experience and technical research in the automatic emulsification of rosin size, in paper mills and Hercules' paper research laboratories.

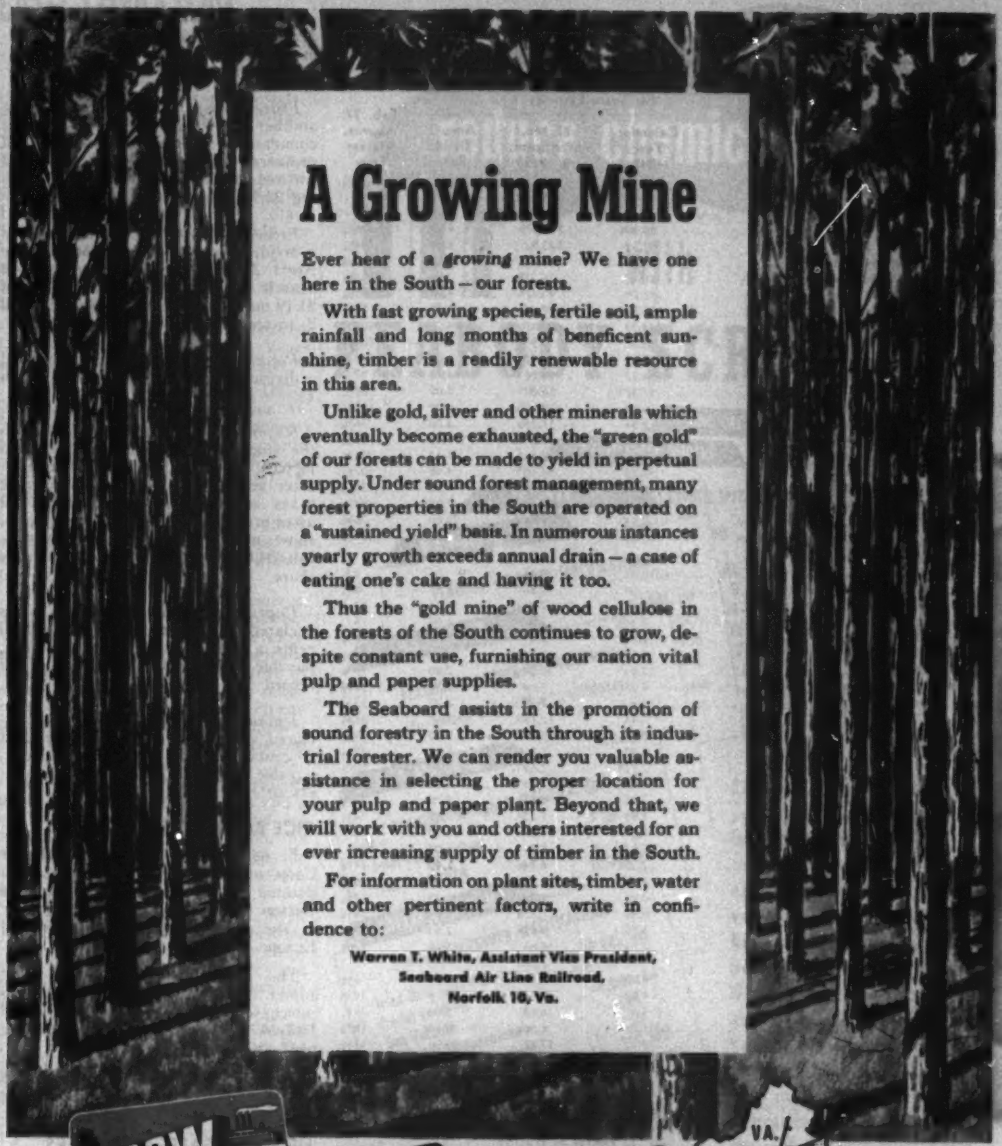
Many new, and established, paper mills have installed the original Hercules automatic emulsifying unit and are benefiting from reduced labor cost, savings in space requirements, and obtaining rosin size emulsions of greater uniformity of concentration and quality.

The new unit offers paper mills all of these advantages plus that of lower original cost.

The completely assembled unit requires a space of approximately 6 by 6 feet. When installed, the only labor required for this automatic process is the preventive maintenance customary for comparable mechanical equipment.

Since Hercules introduced automatic emulsification of rosin size, twenty leading paper mills have adopted the process. Two of these represent the new, simplified unit of which many more are scheduled for early installation. The merits of the original automatic unit are still recognized by the paper industry, and several of these units will be installed in the next few months.

Hercules supplies all equipment for the new, simplified unit except the tank car unloading station, and paste size and emulsion storage tanks. Also, the paper mill supplies the necessary piping and wiring. Paper mills may obtain on layout, construction, and other pertinent information from Hercules' paper mill representatives.



A Growing Mine

Ever hear of a *growing* mine? We have one here in the South — our forests.

With fast growing species, fertile soil, ample rainfall and long months of beneficent sunshine, timber is a readily renewable resource in this area.

Unlike gold, silver and other minerals which eventually become exhausted, the "green gold" of our forests can be made to yield in perpetual supply. Under sound forest management, many forest properties in the South are operated on a "sustained yield" basis. In numerous instances yearly growth exceeds annual drain — a case of eating one's cake and having it too.

Thus the "gold mine" of wood cellulose in the forests of the South continues to grow, despite constant use, furnishing our nation vital pulp and paper supplies.

The Seaboard assists in the promotion of sound forestry in the South through its industrial forester. We can render you valuable assistance in selecting the proper location for your pulp and paper plant. Beyond that, we will work with you and others interested for an ever increasing supply of timber in the South.

For information on plant sites, timber, water and other pertinent factors, write in confidence to:

Warren T. White, Assistant Vice President,
Seaboard Air Line Railroad,
Norfolk 16, Va.

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THROUGH THE HEART OF THE SOUTH

Financial News

STOCK REPORT

	Per Share Earnings		Indic Annual Divid. Rate	Feb. 27 Approx. Market Price
	Calendar Year 1949	12 Mo. to Approx. 9/30/50		
PREFERRED STOCKS				
Armstrong Cork Co. $3.75 Cum.	$40.95*	$48.14a	$3.75	$102⅛
Armstrong Cork Co. $4.00 Cum. Conv.	40.95*	48.14a	4.00	113
Celotex Corp. 5% Cum.	6.80c	11.70e	1.00	17
Champion Paper & Fibre $4.50 Cum.	60.89f	101.62h	4.50	106¼
Container Corp. of Amer. 4% Cum.	89.52	122.92	4.00	104¼
Crown-Zellerbach $4.20 Cum.	94.18e	66.87	4.20	104⅛
Dixie Cup Co. $2.50 Cum. Conv. Cl. A	10.93	16.31b	2.50	55⅛
Flintkote Co. $4.00 Cum.	62.70	90.41b	4.00	105¾
Robert Gair Co., Inc., 6% Cum.	13.79†	17.21†	1.20	19¾
International Paper Co. $4.00 Cum.	224.55	323.40	4.00	108½
Kimberly Clark Corp. 4% Cum.	85.27	114.95i	4.50	108⅛
MacAndrews & Forbes 6% Cum.	61.59	63.03	6.00	143¾
Mead Corp. 4¼% Cum.	51.37	88.30	4.25	97
Mead Corp., 2% Cum. Conv. 2nd	21.35*	36.20*	2.00	65½
Pabco Products, Inc., 4% Cum. Conv.	56.46	120.13b	4.00	101¾
Rayonier, Inc., $2 Cum.	9.54	17.25b	2.00	36⅞
St. Regis Paper Co. 4.40% 1st A	30.74	65.23b	4.40	95⅝
Scott Paper Co. $3.40 Cum.	51.15*	62.16*	3.40	101⅜
Scott Paper Co. $4.00 Cum.	51.15*	62.16*	4.00	107½
Sutherland Paper 4½% Conv.	46.92	81.31b	4.25	120½
U. S. Gypsum Co. 7% Cum.	283.37	429.37	7.00	184½
United Wallpaper Inc., 4% Cum. Conv.	2.14	8.84b	2.00	26⅝
West Virginia Pulp & Paper 4½% Cum.	61.28c	99.26i	4.50	110⅝
COMMON STOCKS				
APW Products Co.	(d)0.81	0.45	—	7¾
American Writing Paper Corp.	.84	0.86	0.50	9½
Armstrong Cork Co.	6.57	7.84a	3.75	53
Celotex Corp.	1.65c	3.03e	1.00	18
Certain-Teed Prods. Corp.	2.84	3.43	1.10	16⅜
Champion Paper & Fibre	5.15f	9.44h	2.45	56⅛
Congoleum Nairn Co.	3.04	2.70a	2.00	27
Container Corp. of America	4.23	5.14	2.50	37⅝
Crown-Zellerbach	6.82c	7.36	2.20	53⅜
Dixie Cup Co.	7.44	12.18b	1.50	55⅝
Eastern Corp.	0.04	3.04	1.00	21¼
Flintkote Co.	4.33	5.83b	3.00	29¼
Robert Gair Co., Inc.	2.11†	2.69†	0.70	12⅞
Great Northern Paper Co.	4.87	3.73	3.00	51¾
International Paper Co.	7.12	8.63	2.50	52½
Johns-Manville Corp.	4.83	7.22h	3.50	54¾
Kimberly Clark Corp.	5.29	6.28i	1.80	46
MacAndrews & Forbes Co.	3.64	3.74	3.00	40
Marathon Corp.	3.29c	4.84e	1.40	44⅞
Mead Corp.	4.10	7.32	2.70	26½
National Container Corp.	0.95	2.00	0.75	12⅜
Pabco Products, Inc.	0.85	1.87b	0.60	19½
Rayonier, Inc.	4.75	9.61b	2.50	50⅛
Ruberoid Co.	7.93	8.63	3.18	58½
St. Regis Paper Co.	0.91	2.10b	0.60	13
Scott Paper Co.	6.07	7.12	3.60	45⅝
Sutherland Paper Co.	4.62	7.66b	2.75	48⅛
Union Bag & Paper Corp.	5.01	6.68	3.00	44½
United Board & Carton	(d)1.61b	1.56g	0.50	18⅞
U. S. Gypsum Co.	13.51	17.87	10.00	117½
United Wallpaper	(d)0.01	(d)0.01h	—	3¼
West Virginia Pulp & Paper	8.58c	13.73i	5.00	81

(a) 12 months to approximately 6/30/50
(b) Year ended 11/13/49
(c) Year ended 1/31/50
(d) Deficit
(e) 12 months to 10/31/50
(f) 9 months to 12/31/49
(g) 12 months to 11/11/50
(h) 12 months to 12/31/50
(i) 12 months to 1/31/51
(*) Earnings per combined preferred shares
(†) Excludes domestic and Canadian subsidiaries and 60% equity in Southern Paperboard Corp.

Abitibi Power & Paper Co., Ltd., passed a by-law, on February 8, authorizing the splitting of the common shares on the basis of three for one, and increasing the authorized subdivided common capital to 6 million shares. Stockholder approval of this action will be requested at a special general meeting to be held at the same time as the annual meeting on April 12, 1951. The directors also declared the following dividends payable on April 1, 1951, to stockholders of record at the close of business on March 1; on the preferred 37½c per share, and on the common (on the old basis) 75c per share.

International Paper Co. declared the regular quarterly dividends of $1 a share on the cumulative $4 preferred stock and 75 cents a share on the $7.50 par value common stock. Both dividends are payable March 26 to holders of record February 23.

Gaylord Container Corp. declared a dividend of 37½c a share on its common stock payable March 10 to stockholders of record March 2.

Fraser Companies, Ltd., reports that another 17,440 shares of 4¼ percent cumulative redeemable sinking fund preferred stock have been purchased for redemption and cancellation, leaving 22,560 shares outstanding.

Fraser Companies, Ltd., has declared a dividend of 50c on common, payable April 23, to stockholders of record March 30 and another dividend of $1.19 on preferred stock, payable April 2, to stockholders of record March 9.

Powell River Co., Ltd., has declared a dividend of 50 cents, payable March 15.

Rayonier Incorporated announced to the stockholders preliminary year-end figures for 1950. Unaudited results, after adjustments for Federal income taxes at the new higher rates and after provision for excess profits taxes, show new income of approximately $10,804,660, or $9.61 per common share.

Puget Sound Pulp & Timber Co. has declared the regular dividend of 50 cents a share on the common stock, payable March 30 to stockholders of record March 13.

Union Bag & Paper Corp. has declared a regular quarterly dividend of 50 cents per share on the capital stock, payable March 12, 1951, to stockholders of record March 5.

RICE BARTON'S AGENT

E. de Vries Co. division of Paper Corp. of United States have been appointed exclusive sales agents for Rice Barton Corp. paper making machinery in the British Isles and Continental Europe.

The Waterbury Corrugated Container Co. of Waterbury, Conn., has purchased the Franklin Paper Co. of Holyoke, Mass. The mill is making testliner.

John Kinsey and John Kunkel are the principal owners of the Waterbury Company.

NEW G. E. SALES MANAGERS

SCHENECTADY, N. Y.—C. B. House, Jr., and Lee J. Mohler have been appointed sales managers of two newly established product line sections in General Electric's small and medium motor divisions. They will head, respectively, the A-C motor section and the D-C motor and generator section of the Lynn (Mass.) motor sales division, according to an announcement by D. A. Yates, division manager.

HERCULES POWDER CO.'s San Francisco office has been moved to the Standard Oil Building, 225 Bush street.

NEW LITERATURE

American Car and Foundry Co. Pamphlet, "Welded Pressure Vessels." Sales and technical copy on storage tanks.

Thwing-Albert Instrument Co. Leaflet P-500, "Paper Testing Instruments." Briefs the Elmendorf Tearing Tester; Basis Weight Scales; Clark Softness-Stiffness Tester; Pulp or Fiber Classifier (Fractionator); Electro-Hydraulic Tensile Strength Tester; Inkometer; I. P. C. Electric Hygrometer, etc.

Schnellpressenfabrik Heidelberg. Commemorative booklet, "100 Years of Heidelberger Printing Machines."

General Electric Co. Bulletin GEA-5571, "Inductrol Power Packs for AC Lighting and Power Service." Includes Type AK-1-25 primary air circuit breaker, Type D lighting transformer, and the necessary Type AIRS air-cooled induction regulators.

Vulcan Soot Blower, Div. Continental Foundry & Machine Co. Bulletin 485, "The New Vulcan P-3, Rotary Soot Blower Head."

U.S. Department of Commerce. "Bibliography of Technical Reports," 50 cents. Features specific developments in the correlation of fungicidal activity with the chemical structure of organic materials; fault current analysis for electrical systems; the performance of shock mounts; and improvements in off-channel rejection systems for electronic equipment.

United Gasket Co. Catalog. Presents the Ajax Spiral Wound Gaskets and a line of metal, metal-asbestos and cut gaskets. Also introduces Teflon, its properties and uses, and details the various Teflon "Chemiseal" gaskets, packings, etc.

British Information Services. Sheet, "Buyers' Guide to British Industries Fair." Highlights annual trade exhibition scheduled for London and Birmingham, Eng., April 30 through May 11.

Worthington Pump & Machinery Corp. Bulletin 2-212-B6. Describes the Type CM Precipitating Softener and Coagulator, in which energy for floc preparation is mechanical.

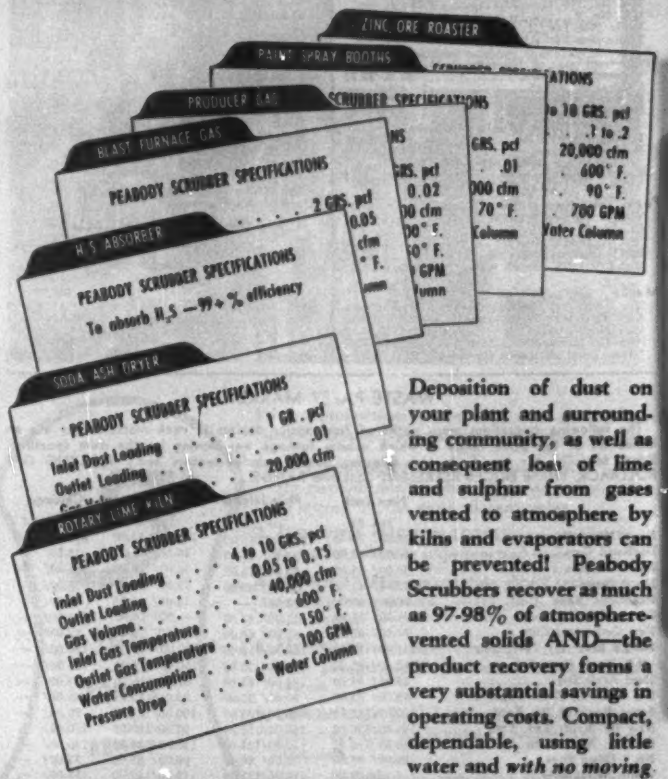
Exporters' Digest. Silver Anniversary Issue. Features "Our Foreign Trade in 1951," 108 pp., price 50c.

Taylor-Wharton Iron & Steel Co. Sales copy, "Tisco, Castings for the Pulp and Paper Industry." Illustrates and describes manganese steel beater rolls, Jordans, plug sleeves, rag slitters, wood chipper spout liners, barking drum chains, sprocket wheels, etc.

Pangborn Corp. Book, "Industrial Dust Control Through Exhaust Systems," 50 pp. Illustrates and describes, in three major sections, (1) exhaust hoods and piping systems; (2) dust collecting equipment; and (3) exhausters and drives.

reduce chemical losses with

PEABODY SCRUBBERS



Deposition of dust on your plant and surrounding community, as well as consequent loss of lime and sulphur from gases vented to atmosphere by kilns and evaporators can be prevented! Peabody Scrubbers recover as much as 97-98% of atmosphere-vented solids AND—the product recovery forms a very substantial savings in operating costs. Compact, dependable, using little water and *with no moving parts,* Peabody Scrubbers, proved by 20 years of use, may well offer startling economies and cleaner processing for your plant.

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PRICES

The prices below reflect market quotations in New York at the mill level on standard grades. Most orders accepted, however, at price prevailing on date of shipment. Does not include spot offerings.

PAPER AND BOARD

Standard News, Delivered Ports

Rolls, contract, per ton	$105.00/110.00
Sheets	118.00/ —

F.o.b. Mills. C.l. Frt. allowed, dock, N. Y.

Kraft— per cwt., 40# base wgt.

Standard Wrapping Rolls	$7.75/ —
No. 1 Wrapping Rolls	8.25/ 8.50
Standard Bag	7.50/ —

Tissues— per ream 24x36 (480) 10 lbs. 2500 lbs or more

Wh. No. 1 Frd.	$1.85 /$2.50
Wh. No. 1 MG	1.85 / —
Wh. No. 1½	1.75 / —
Wh. No. 2	1.65 / —
Kraft Non-Tar	1.70 / —
White Non-Tar	

Toilet—per case of 100 rolls—1 M sheets

Unbleached 4½x4½	$8.00/$8.25
Unbleached 4½x5	‡ 6.60/ —
Bleached 4½x4½	7.10/ 8.80
Bleached 4½x5	‡ 9.05/ —
Per Case of 50 rolls—2000 sheets	
Unbleached 4½x4½	$8.00/$8.25
Bleached 4½x4½	6.95/ —
Per Case of 100 rolls—1000 sheets	
Facial, 4½x5, 2-ply	‡ $8.95/10.65

Paper Towels—per case of 3750

Wh. Jr. M'tif'd 9¼x9½	$5.65
Br. Sr. M'tif'd 10x12	4.00
Br. Jr. M'tif'd 9½x9¾	3.50
Br. Jr. Sgl. fold 10x10¾	3.35
Bichd. 7½x11, 24/25 rolls	‡ $6.00/7.55

Manila, per cwt.

No. 1 Jute Tag, 100-lb., sheets*	$19.55/21.55
Reg. Jute M.F. 40-lb., sheets*	18.00/20.00
Wrapping Manila	8.75/10.50
Printing Manila	10.50/12.00

* Less usual allowance for rolls.

WORLD WOOD PULP MARKETS

First Quarter Contract Prices, Per Short Air-Dry Ton

Varying freight allowances

	U. S.	Canadian	Swedish	Atlantic Ports Finnish	Norwegian
Groundwood	$85.00/100.00	$85.00/100.00			
Sulphate, Bleached	135.00/200.00	175.00/ —	*180.00/187.00†		Competitive
Sulphate, Unbl. Northn.		147.50/155.00	*155.00/185.00*		
Sulphate, Unbl. Southn.					
Sulphite, Bichd. (Sftwd.)	135.00/165.00	145.00/ —	*175.00/ —	Competitive	Competitive
Sulfite, Bichd. (Hdwd.)	150.00/175.00				
Sulphite, Unbichd.	122.50/150.00	132.50/150.00	*155.00/165.00		
Sulphite, Unbl'd (Glassine)		143.00/146.50	*157.00/ —		
Soda, Bichd.	140.00/142.50	140.00/142.50			
Sideruns, Pulping News	106.00/ —	106.00/ —			

* On dock. † Delivered.

Gummed Tape—per bdl., 500 bdls. or more

90-lb. 375 ft. GSI	$6.90 / —
60-lb. 600 ft. GSI	6.90 / —
35-lb. 800 ft. GSI	7.93½/ —
35-lb. 500 ft. GSO	5.98 / —

Boards, per ton—

Filled News	$107.50/ —
Plain Chip	105.00/107.50
Bichd. Mis. L-d. Chip	147.50/ —
White Pat. coated .020	170.00/ —
Kraft Liners 42 lb.	115.00/117.50
Kraft Corr. .009	122.50/126.00
Binders Boards	137.50/140.00

The following prices are representative distributors' resale prices.

Rag Content Bonds and Ledgers—
White, 20 lb.

Bonds	4 Ctns.
	per cwt.
100% Rag Ex. No. 1	$70.45/$72.10
100% Rag	42.45/ —
75% Rag	48.15/ —
50% Rag	38.90/ —
25% Rag	31.65/ 33.00

Ledgers	4 Ctns.
	per cwt.
100% Rag Ex. No. 1	$72.65/ —
100% Rag	63.90/ —
75% Rag	49.40/ —
50% Rag	40.20/ —
25% Rag	33.00/ —

Sulphite Bonds and Ledgers
White, 20 lb.

Bonds	4 Ctns.
	per cwt.
Watermarked	‡ $19.00/$20.50
Plain	‡ 18.05/ 19.50

Ledgers	4 Ctns.
	per cwt.
Watermarked	‡ 20.30/$21.90
Plain	‡ 19.35/ 20.80

White Book

Conversion Coated	Case
	per cwt.
No. 1	$23.40/$24.65
No. 2	21.90/ 23.40
No. 3	‡ 20.40/ 22.40
Machine Coated	
No. 1	‡ $18.15/$18.40
No. 2	‡ 16.15/ 16.65
Uncoated	
No. 1 Antique (Watermarked)	‡ $18.65/$19.15
Offset	‡ 17.40/ 19.90
A Grade E. F.	17.40/ 18.15
A Grade S. C.	18.15/ 18.65
B Grade E. F.	17.65/ —
B Grade S. C.	‡ 16.90/ 18.40

‡ Indicates a price change.

WASTE PAPER MARKET

The following quotations were gathered from major dealers in each market. They are an indication of the price range in which volume tonnage was moving on the date specified. Prices to mills, per ton, f.o.b. cars shipping point (includes brokers' fee.) PENDING OPS ROLLBACK, THESE PRICES REPRESENT CEILING RANGE.

	New York Jan. 25	Philadelphia Jan. 25	Boston Jan. 25	Chicago Jan.4
No. 1 Mixed Paper	$32.00/ 35.00	$32.00/ 35.00	$29.00/ 32.00	$33.00/ —
Boxboard Cuts	30.00/ 33.00	30.00/ 33.00	26.00/ —	38.00/ —
Mill Wrappers	30.00/ 35.00	30.00/ 35.00	30.00/ 36.00	35.00/ —
No. 1 News	37.00/ 41.00	33.00/ 40.00	33.00/ 36.00	38.00/ —
Over-issue News	40.00/ 45.00	40.00/ —	33.00/ 45.00	41.00/ —
Corrugated Containers	64.00/ 70.00	55.00/ 62.00	49.00/ 70.00	52.00/ —
New Corrugated Cuts	74.00/ 80.00	55.00/ 60.00	55.00/ 65.00	62.00/ —
Double Kraft Ld. Corr. Cuts	115.00/120.00	105.00/110.00	120.00/140.00	120.00/ —
100% Kraft Corr. Cuts	140.00/165.00	125.00/135.00	130.00/170.00	135.00/ —
Used Kraft Bags	85.00/ 95.00	80.00/ 85.00	85.00/116.50	65.00/ —
No. 1 Brown Kraft Paper	90.00/ 95.00	90.00/ 95.00	90.00/110.00	65.00/ —
Super Resorted Br. Kraft	100.00/105.00	100.00/105.00	100.00/125.00	90.00/ —
New Br. Kraft Env. Cuts	160.00/190.00	160.00/175.00	160.00/180.00	150.00/ —
New Br. Kraft Cuts	150.00/170.00	130.00/135.00	150.00/180.00	140.00/ —
No. 1 Gdwd Shvs.	80.00/ 85.00	75.00/ 80.00	80.00/ 85.00	75.00/ —
White Newsblanks	115.00/125.00	110.00/115.00	110.00/120.00	115.00/ —
No. 1 Flyleaf Shvs.	80.00/ 85.00	90.00/ 95.00	95.00/110.00	110.00/ —
No. 1 Soft Wht. Shvs.	180.00/190.00	170.00/175.00	175.00/195.00	175.00/ —
Super Soft Wht. Shvs.	190.00/200.00	190.00/200.00	190.00/210.00	185.00/ —
Hd. Wht. Shvs.	185.00/205.00	200.00/215.00	190.00/215.00	180.00/ —
Hd. Wht. Env. Cuts	200.00/245.00	225.00/ —	200.00/235.00	190.00/ —
New Manila Env. Cuts	140.00/150.00	160.00/165.00	140.00/165.00	115.00/ —
Col. Tab Cards	110.00/120.00	115.00/120.00	95.00/150.00	100.00/ —
Manila Tab Cards	170.00/180.00	165.00/175.00	160.00/200.00	165.00/ —
No. 1 Mixed Ledger	100.00/105.00	100.00/105.00	90.00/110.00	100.00/ —
White Ledger	130.00/140.00	125.00/130.00	125.00/140.00	125.00/ —
No. 1 Book & Mag.†	55.00/ 60.00	40.00/ 45.00	40.00/ 60.00	35.00/ —
No. 1 Rep'd. Hvy. Bonded‡	65.00/ 70.00	50.00/ 60.00	60.00/ 75.00	55.00/ —

* Delivered. † Includes Time & Life; no coarse groundwood. ‡ Not to exceed 10% groundwood.

RAG MARKET

New Domestic Cotton Cuttings
(Prices to Dealers, F.o.b. Ship. Pt.)

ALL PRICES NOMINAL

No. 1 White Shirts	$23.00/$24.00
No. 1 Unbichd. Muslins	23.00/ 24.00
Bichd. Canton Flannels	17.00/ 18.00
No. 1 Lt. Silesias	12.00/ 13.00
No. 1 Lt. Prints	9.00/ 12.00
Wht. Bk. Blue Overalls (Bichable)	15.50/ 16.00
No. 1 Blue Overalls	7.00/ 8.00
Fancy Shirts	6.00/ 6.50
No. 1 Washables	5.50/ 6.00
Suntan Khaki Cuts	11.00/ 12.00
Mixed Khaki Cuts	9.00/ 11.00
Corduroy Cuts	4.75/ 5.25
Cottonades	7.00/ 7.50
Bichd. Underwear Cuts	nominal
Unbichd. Underwear Cuts	nominal

Old Domestic Cotton Rags
(Prices to Dealers, F.o.b. Ship. Pt.)

ALL PRICES NOMINAL

	Per 100 lbs.
Mixed White	$5.00/$5.50
Cotton Pants & Overalls	4.75/ 5.00
Thirds and Blues, Repacked	3.75/ 4.00
No. 1 Roofing Rags	3.00/ 3.10
No. 2 Roofing Rags	2.40/ 2.50
No. 3 & 4 Roofing Rags	2.20/ 2.30
Roofing Bagging	2.20/ 2.30

New Foreign Cotton Cuttings
(Prices to Mills, F.o.b. Dock, N.Y.)

	Per 100 lbs.
New Dark Cuttings	$4.75/$5.00
New Mixed Cuttings	4.75/ 5.25
Light Silesias	8.00/ 8.50
Light Flannelettes	7.50/ 8.00
New White Cuttings	nominal
New Unbleached Cuttings	nominal
Fancy Shirt Cuttings	6.50/ 7.50

Light Prints	6.50/ 7.50
Bleachable Khaki, No. 1	6.00/ 6.50
Unbl. Khaki, No. 1	5.00/ 5.50

Old Foreign Rags

(Prices to Mills, f.o.b. Dock, N. Y.)

	Per 100 lbs.
No. 1 White Cottons	nominal
No. 2 White Cottons	nominal
No. 3 White Cottons	nominal
No. 4 White Cottons	nominal
Extra Light Prints	5.50/ 6.00
Old Light Prints	4.50/ 5.00
Med. Light Prints	3.75/ 4.00
Dutch Blue Cottons	4.00/ 4.50
Linsey Garments	2.75/ 3.00
Dark Cottons, European	2.75/ 3.00
Dark Cottons, Egyptian	2.50/ 2.75
Old Shoppertes	2.40/ 2.50
New Shoppertes	2.50/ 2.75

Bagging

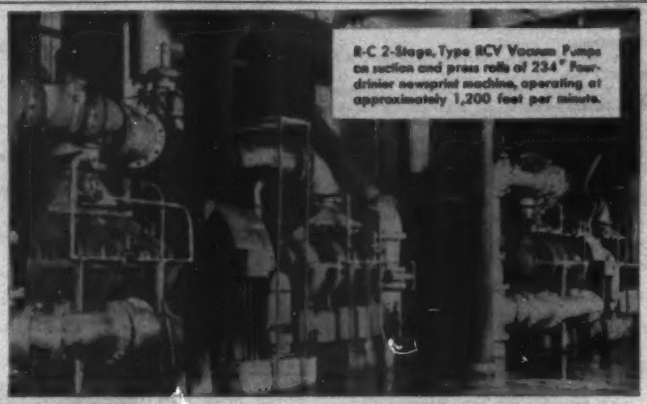
(Prices to Dealers, f.o.b. N. Y.)

	Per 100 lbs.
Foreign Gunny	$8.00/$8.25
Domestic Gunny, No. 1	7.75/ 8.00
Heavy Wool Tares	7.00/ 7.50
Foreign Manila Rope	7.25/ 7.75
Domestic Manila Rope	7.00/ 7.25
Jute Strings	6.25/ 6.50
No. 1 Sisal Strings	7.25/ 7.50
Mixed Strings	nominal
Paper Mill Tares	5.25/ 5.75
No. 1 Scrap Burlap	
Foreign	6.50/ 6.75
Domestic	7.00/ 7.50
Austr. Wool Pouches	7.50/ 8.50
New Burlap Cuttings	7.50/ 8.00

MATERIALS

Aluminum, sulfate:		
comi. bags, wks.	cwt.	1.65
iron-free c.l.		3.25
Alcohol, ethyl:		
tax free, dms. c.l.	gal.	.77 / 1.03
dcld. East Miss.		
Alcohol, methyl:		
Synthetic, Zone 1, dms. c.l. fit. afld.	gal.	.44
Casein, acid-prec.:		
dom. sh. pt. c.l.	lb.	.42 / .45
imp. ex dock	lb.	.40½/ .41
Caustic soda:		
c.l. wks. solid, 76%, cwt.		3.35
fak. & grd. 100-lb. drums		3.75
liquid 50% tanks		2.55
liquid 70% tanks		2.65
China clay:		
dom. air-float. filler, c.l. wks.	ton	10.00
water-washed, lump, filler		11.00
coating		17.60 /30.50
imported, ex whse.	short ton	15.20 /28.35
Chlorine:		
single-unit tanks, works	cwt.	2.70
multi-unit	cwt.	3.20 / 4.40
Formaldehyde:		
USP, ink. dms, c.l. wks.	lb.	.0600/ .0625
l.c.l. E. whs.		.0650/ .0675
Fuel oil:		
Bunker C, No. 6 Cal. Ivy tanks, refinery	bbl.	1.95 / 2.15
light	bbl.	2.05 / 2.10
Hydrogen peroxide:		
USP, 35% chys. E. of Miss.	lb.	.24½/ .25½
Lime:		
hydrated, bags, wks. Buffalo	ton	13.50
Rosin:		
B gum, drum, c.l. Savan.	cwt.	8.00
G, H, I, K	cwt.	8.70 / 8.79
FF, wood, do.	cwt.	7.30
Rosin size:		
70%, gum & pale grds, tank cars, south, sh. pt.	cwt.	6.80 / 7.00
Salt cake:		
dom. bulk, c.l. whs.	ton	17.00
whs. frt. all.	ton	20.00 /22.00
Soda ash:		
light, 58%, bags, whs.		1.50
bulk	cwt.	1.30
Sodium silicate 40°:		
turbid, c.l. whs.	cwt.	1.20
l.c.l. whs.		1.55 / 1.95
Sodium peroxide:		
dms. c.l. E. of Miss.	lb.	.19
l.c.l. do.	lb.	.19½/ .20
Soybeans, protein:		
chem. leal, whs. c.l.	lb.	.24 / —
Cinn. and Chic.		
Sulfuric acid:		
60° Be. chys. cl. whs.	cwt.	1.75 / —
l.c.l. whs.	cwt.	2.05 / 2.60
Sulfur:		
crude, c.l. mines, contract,	long ton	21.00 /22.00
f.o.b vessels Gulf		22.50 /23.50
Export, f.o.b. Gulf		25.00
Sulfur dioxide:		
liquid, comi. cyl. whs.	lb.	.09
multi-unit cars	lb.	.0135
Starches:		
pearl corn, bags, c.l. whs.	cwt.	6.25 / —
white dextrines, c.l. whs.	cwt.	7.65 / —
potato, Idaho, c.l. whs.	cwt.	5.90 / —
potato, Maine, c.l. whs.	cwt.	5.25 / —
tapioca, conv. dextrines	cwt.	7.80 / 8.00
medium grds. Gulf and East Coast ports		6.75 / 7.50
low, Siam, ex dock N. Y.		5.00 / 5.50 nominal
Talc:		
domestic, 50-lb. sacks, c.l. whs.	ton	25.00 /30.00
Titanium dioxide:		
anastase, c.l. dcld., bags	lb.	.21 / .21½
l.c.l. dcld.	lb.	.22 / .22½
rutile, c.l. dcld.	lb.	.23 / .23½
l.c.l. dcld.	lb.	.24 / .24½

N.B.: For special market conditions, see *Trends*.



R-C 2-Stage, Type RCV Vacuum Pumps on suction end press rolls of 234" Fourdrinier newsprint machine, operating at approximately 1,200 feet per minute.

5 VITAL POINTS ABOUT VACUUM PUMPS

Protect production by checking your present or planned vacuum pumps against these 5 basic needs:

1. **LOW POWER CONSUMPTION**—because units are recommended, either single or compound, to operate at the most efficient point.
2. **NEGLIGIBLE FRICTION LOSSES**—no contact between impellers or impellers and casings.
3. **HIGHER SPEEDS**—permitting direct connection to standard motors, saving first cost, space and weight.
4. **FLEXIBILITY**—to meet varying demands; suction automatically overcomes resistance in system.
5. **DEPENDABILITY**—long-time, attention-free operation, due to simplified design and construction.

Bulletin 50-B-13 tells you how R-C Cycloidal Vacuum Pumps deliver these 5 vital requirements, plus other advantages.

Roots-Connersville Blower Corporation
510 River Avenue, Connersville, Indiana

ROOTS-CONNERSVILLE
BLOWER BUILDERS SINCE 1854
ONE OF THE DRESSER INDUSTRIES

IMPORTS

IMPORTS AT NEW YORK

Weeks Ending Feb. 17 & 24

Newsprint

Montmorency Paper Co., Trollefoss, St. Johns, 2,884 rolls.
(———), Cornerbrook, Cornerbrook, 4,351 rolls.
(———), Markland, Liverpool, N.S., 3,800 rolls, 3,266 rolls (Alexandria, Va.)
Madden Reeve Angel & Co Inc., Mormacsuk, Kotka, 344 rolls.
Gilman Paper Co., S. Thorden, Hallstavik, 113 rolls.
Madden Reeve Angel & Co. Inc., Mormacwave, Hango, 2,562 rolls.
Madden Reeve Angel & Co. Inc., Sparrecholm, Kotka, 621 rolls.
N. Y. Journal American, Markland, Liverpool, N.S., 743 rolls.
N. Y. Daily Mirror, Markland, Liverpool, N.S., 178 rolls.
N. Y. Herald Tribune, Markland, Liverpool, N.S., 1,573 rolls.
N. Y. World Telegram, Markland, Liverpool, N.S., 650 rolls.
Brooklyn Eagle, Inc., Markland, Liverpool, N.S., 794 rolls.
Brooklyn Eagle Press, Inc., Markland, Liverpool, N.S., 52 rolls.
Herald Statesman, Inc., Markland, Liverpool, N.S., 28 rolls.
N. Y. Times Co., Markland, Liverpool, N.S., 150 rolls.
Trade Union Service Inc., Markland, Liverpool, N.S., 122 rolls.
W. D. Peck, Markland, Liverpool, N.S., 256 rolls.
Advance Pattern Co., Markland, Liverpool, N.S., 56 rolls.
Price & Pierce, Ltd., Markland, Liverpool, N.S., 154 rolls.
Richmond Newspapers, Inc., (Richmond, Va.), Markland, Liverpool, N.S., 1808 rolls.
Pepper Printing Co., (Richmond, Va.), Markland, Liverpool, N.S., 70 rolls.

Wallboard

Mohawk Iron & Steel Corp., American Clipper, London, 3 cs.
G. T. Ross, Burckel, Antwerp, 48 crates.
Treetex Corp., S. Thorden, Stockholm, 63 crates.
Elof Hansson, Inc., Sparrecholm, Gothenburg 646 crates, 350 bls.
J. H. Schroeder Banking Corp., Sparrecholm, Halmstad, 500 bls.

Writing Paper

H. W. Robinson Co., Washington, Havre, 7 cs.

Cigarette Paper

F. P. Gaskell Co., American Traveler, Glasgow, 20 cs. (for tupping).

Printing Paper

E. de Vries Co., Noordam, Rotterdam, 4 cs.
S. H. Pomerance & Co., American Clipper, London, 1 cs.
Hudson Shipping Co., American Clipper, London, 9 cs.
A. Doniger Paper Co., Exporter, Trieste, 131 bls.
A. Doniger Paper Co., Sea Leader, Hamburg, 138 bls.

Paper Napkins

Freund-Mayer Co., Venezuela, Copenhagen, 36 ctns.

Paper Serviettes

(———), Britannic, Liverpool, 11 crates.

Crepe Paper

Brundage Merchandise Co., Veendam, Rotterdam, 27 cs.

Filter Paper

Stevens Nelson Paper Corp., Port Campbell, London, 37 cs.

Rice Paper

Kane Import Co., American Press, Keelung, 15 cs.

Match Paper

Carolina Absorbent Cotton Co., Sea Leader, Rotterdam, 84 rolls (blue).

Parchment

Gerhard & Hey, Queen Mary, Southampton, 1 cs.

Tracing Paper

E. de Vries Co., American Jurist, Antwerp, 32 bbls. (in rolls).

Photo Paper

J. J. Gavin & Co., Queen Mary, Southampton, 1 cs.
Alco Photo Supply Corp., Queen Mary, Southampton, 8 cs. (sensitized).
J. J. Gavin & Co., Queen Elizabeth, Southampton, 8 cs. (unsensitized).

Paper Waste

Pulp Sales Corp., Mormacwave, Hango, 631 rolls.

Tissue Paper

B. F. Drakenfeld & Co., Britannic, Liverpool, 24 cs. (gauze carbonizing).

Grease-proof Paper

Public National Bank Trust Co., Veendam, Rotterdam, 4 cs.

Stencil Paper

Stevens Nelson Paper Corp., Hainan, Kobe, 4 cs.
Stevens Nelson Paper Corp., American Press, Kobe, 5 cs.

Surface Coated Paper

Gevaert Co. of America, J. Maerak, Antwerp, 17 cs.
Gevaert Co. of America, K. C. Rognaes, Antwerp, 23 cs.
Gevaert Co. of America, Burckel, Antwerp, 19 cs.
Gevaert Co. of America, American Jurist, Antwerp, 9 cs.

Baryta Coated Paper

Lep Transport, Inc., American Clipper, London, 50 rolls.

Wallpaper

Intermaritime Forwarding Co., Britannic, Liverpool, 16 cs.
C. A. Haynes & Co., American Clipper, London, 42 bls.
W. H. S. Lloyd & Co., American Clipper, London, 3 bls.
(———), Liberte, Havre, 6 cs.
Intermaritime Forwarding Co., Media, Liverpool, 21 ctns.
Intermaritime Forwarding Co., American Packer, Liverpool, 217 ctns.
Hudson Shipping Co., America, Southampton, 4 cs.
Lieberman & Waelchli, Elin Haven, Yokohama, 11 cs. (silk cloth), 20 cs. (grasscloth).
E. Miltenberg, Elin Haven, Shimidzu, 28 cs. (grasscloth).

Wrapping Paper

Plastic Shade Co., Aaagtedyk, Antwerp, 6 cs.
F. C. Strype, American Traveler, Glasgow, 5 rolls, (kraft).
Paper Corp. of U.S., American Traveler, Glasgow, 81 rolls.
J. Heathcoat, Queen Mary, Southampton, 1 cs.
Jay Madden Corp., Mormacwave, Hango, 124 rolls (sulphite).

Raw Base Paper

Lep Transport, Inc., American Clipper, London, 70 rolls.
Remington Rand, Inc., American Clipper, London, 24 rolls.

Drawing Paper

Windsor Newton Co., American Clipper, London, 8 cs.
H. Reeve Angel & Co. Inc., Port Campbell, London, 2 cs.

Baryt Paper

W. Reinserdes, Washington, Bremen, 1 cs.

Gummed Paper

B. F. Drakenfeld & Co., Media, Liverpool, 57 cs., 14 drums.
B. F. Drakenfeld & Co., American Packer, Liverpool, 95 cs.

Jointing Paper

Keasby & Mattison, Media, Liverpool, 6 pkgs.

Miscellaneous Paper

Keuffel & Esser Co., Washington, Bremen, 196 cs.
Stevens Nelson Paper Corp., Elin Haven, Yokohama, 3 cs.

Rags, Baggings, etc.

(———), American Traveler, Glasgow, 18 bls. paperstock, 79 bls. old strings.
A. Siegle Corp., American Traveler, Glasgow, 51 bls. bagging.
A. Siegle Corp., American Traveler, Manchester, 381 b\u. jute waste.
J. Eisenberg & Son, American Traveler, Manchester, 24 bls. cotton rags.
Saldor Trading Corp., American Traveler, Manchester, 171 bls. jute waste.
E. J. Lang, American Traveler, Manchester, 20 bls. old bagging.
Lousnar Textile By-Products, American Traveler, Manchester, 52 bls. old bagging.
(———), American Traveler, Manchester, 52 bls. strings.
Saldor Trading Corp., Media, Liverpool, 75 bls. jute waste.
Castle & Overton, Inc., Media, Liverpool, 74 bls. paperstock.

ENGLISH ECCO CLAYS CLAYS

TRADE MARK

UNIFORM SUPERIOR DEPENDABLE

English China Clays Sales Corporation
551 Fifth Avenue, New York City

Saldor Trading Corp., Britannic, Liverpool, 201 bls. jute waste.

Chemical National Bank, Britannic, Liverpool, 81 bls. paperstock.

Wallworth Co., Aagtedyk, Antwerp, 69 bls. paperstock.

A. de Vries Trading Corp., Aagtedyk, Rotterdam, 54 bls. scrap bagging.

National City Bank, Aagtedyk, Rotterdam, 73 bls. old bagging.

Jay Bee Fibre Corp., Lista, Rouen, 20 bls. cotton waste pickers.

E. J. Lang, Lista, Rouen, 90 bls. rags, 301 bls. scrap bagging.

Midwest Waste Materials Co., Lista, Rouen, 40 bls. rags.

Castle & Overton, Inc., Lista, Rouen, 46 bls. light cotton rags.

A. de Vries Trading Corp., Maria, Genoa, 76 bls. scrap bagging, 131 bls. dark cotton rags.

Manufacturers Trust Co., Maria C., Genoa, 199 bls. old bagging.

(———), Maria C., Genoa, 31 bls. old bagging.

H. Adlerstein, Maria C., Genoa, 119 bls. rags.

Midwest Waste Materials Co., Pres. Monroe, Leghorn, 169 bls. jute card waste.

A. de Vries Trading Corp., Nyhaug, Genoa, 79 bls. scrap bagging.

National City Bank, Nyhaug, Alexandria, 73 bls. light hessians, 45 bls. hessian bagging, 101 bls. hessian tares.

Royal Manufacturing Co., Nyhaug, Alexandria, 185 bls. jute waste bagging.

(———), J. Maersk, Havre, 55 bls. rags.

Lep Transport, Inc., J. Maersk, Havre, 36 bls. rags.

Leigh Textile Co., J. Maersk, Rouen, 45 bls. rags.

Midwest Waste Materials Co., J. Maersk, Rouen, 143 bls. rags.

A. de Vries Trading Corp., J. Maersk, Rotterdam, 136 bls. old bagging.

E. Butterworth & Co., Inc., Domfront, Dunkirk, 53 bls. jute waste bagging.

Chase National Bank, Domfront, Bordeaux, 55 bls. rags.

Midwest Waste Materials Co., Domfront, Bordeaux, 205 bls. rags.

Irving Trust Co., Sarah O. Jewett, Piraeus, 87 bls. old bagging.

Chemical Bank Trust Co., Sarah O. Jewett, Piraeus, 112 bls. rags.

Castle & Overton, Inc., Maidan, Calcutta, 61 bls. hosiery cuttings.

(———), Steel Artisan, Bombay, 100 bls. old jute rags.

D. Benedetto, Steel Artisan, Bombay, 53 bls. rags.

E. J. Keller Co. Inc., Sea Leader, Rotterdam, 46 bls. old bagging.

National City Bank, Sea Leader, Rotterdam, 75 bls. old bagging.

Bemo Shipping Co., Sea Leader, Rotterdam, 89 bls. old rags.

Irving Trust Co., S. Maersk, Hong Kong, 35 bls. rags.

New England Waste Co., Excelsior, Madras, 100 bls. old jute rags.

E. J. Keller Co. Inc., Excelsior, Alexandria, 89 bls. bagging.

Chemical Bank Trust Co., E. Bakke, Bombay, 196 bls. cotton rags.

Castle & Overton, Inc., American Packer, Belfast, 30 bls. new light prints.

(———), Exeter, Naples, 64 bls. waste bagging.

D. Benedetto, Exeter, Beirut, 182 bls. old colored cotton rags.

1st National Bank of Boston, Exporter, Venice, 56 bls. old jute bagging.

(———), Exporter, Venice, 98 bls. rags.

Castle & Overton, Inc., Exporter, Trieste, 106 bls. jute rags.

(———), Exporter, Trieste, 31 bls. rags.

(———), Exilona, Marseilles, 76 bls. rags.

Guaranty Trust Co., Foria, Marseilles, 245 bls. bagging.

State Street Trust Co., Foria, Marseilles, 141 bls. rags.

A. de Vries Trading Corp., Foria, Marseilles, 36 bls. rags.

Robbins Trading Co., Foria, Marseilles, 52 bls. rags.

(———), Foria, Marseilles, 75 bls. bagging waste.

Manufacturers Trust Co., Foria, Marseilles, 211 bls. paperstock.

National Bank of Detroit, Foria, Marseilles, 103 bls. rags.

Castle & Overton, Inc., J. Schulte, Antwerp, 20 bls. new cotton rags.

E. J. Lang, J. Schulte, Antwerp, 53 bls. scrap bagging.

J. Eisenberg, J. Schulte, Antwerp, 11 bls. paperstock.

A. de Vries Trading Corp., Bihac, Antwerp, 791 bls. scrap bagging.

Midwest Waste Materials Co., Bihac, Antwerp, 12 bls. paperstock, 51 bls. scrap bagging, 44 bls. old coal bags.

J. Eisenberg, Oriente, Havana, 44 bls. rags.

Harris Goldman, Co., S. Thorden, Copenhagen, 49 bls. rags.

E. J. Keller Co. Inc., Exeter, Alexandria, 264 bls. old bagging.

D. Benedetto, Foria, Alexandria, 83 bls. old bagging.

Royal Manufacturing Co., Foria, Alexandria, 108 bls. waste bagging.

Castle & Overton, Inc., Port Campbell, London, 16 bls. cotton cuttings.

(———), Port Campbell, London, 112 bls. old jute bagging.

Peerless Chemical Corp., Port Campbell, London, 56 bls. rags.

Old Rope

Brown Bros., Harriman & Co., Kristina Thorden, Lyseki, 68 coils.

International Purchasing Co., Venezuela, Copenhagen, 141 coils.

C. Smiles, American Traveler, Manchester, 694 bls. (hemp cordage waste).

PRICE & PIERCE
LTD.

Wood Pulp and Paper Agents

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WEST VIRGINIA
PULP and PAPER COMPANY

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WE CUSTOM BLEACH LINTERS FURNISHED BY YOU OR US
LIMITED TONNAGE AVAILABLE
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ALPHA CELLULOSE CORP.
BLOOMINGTON ILLINOIS

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TAYLOR-STILES Company
for both large and small **PAPER MILLS**
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Modern Recovery Furnaces—engineered and constructed by Ferguson to meet your specific requirements will, as they have for others, lower your operating costs.
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ENGINEERS AND BUILDERS
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District Offices: New York, Houston, Chicago, Los Angeles, Cincinnati

National City Bank, J. Maersk, Rotterdam, 50 rolls.

E. J. Keller Co. Inc., Bihac, Antwerp, 64 bls. old rope.

Casein

American Cyanamid Co., Uruguay, Buenos Aires, 2,000 bags (lactic).

The Borden Co. Chemical Division, Uruguay, Buenos Aires, 500 bags (lactic), 300 bags.

N. Y. Trust Co., Uruguay, Buenos Aires, 2,600 bags (lactic).

Eugenio Lang, Uruguay, Buenos Aires, 1,400 bags (lactic).

Tupman Thurlow Co., Spenser, Buenos Aires, 600 bags.

Eugenio Lang, Rio Jachal, Buenos Aires, 1,500 bags.

Marks & Coyle, Trelliswick, Napier, 640 bags.

Woodpulp

Price & Pierce, Ltd., Sacramento, Hull, 3,800 bls. cellulose pulp.

Perkins Goodwin & Co., Lyngenfjord, Drammen, 250 bls. prime dry bleached sulphite pulp.

Atlantic Forwarding Co., Exanthia, Trieste, 469 bls. chemical pulp.

Atlantic Forwarding Co., Exilona, Trieste, 600 bls. woodpulp.

Woodpulp Boards

Jay Madden Corp., Mormacoak, Kotka, 113 bls.

Jay Madden Corp., Sparreholm, Kotka, 98 bls.

Parsons & Whittemore, Inc., Sparreholm, Gothenburg, 76 bls.

Parsons & Whittemore, Inc., Gripsholm, Gothenburg, 111 bls., 289 rolls.

Jay Madden Corp., Mormacwave, Hango, 503 bls.

IMPORTS AT NEWARK

Weeks Ending Feb. 17 & 24

Pagel, Horton & Co., Inc., Kristina Thorden, Karskar, 2,440 bls. woodpulp.

Pagel, Horton & Co., Inc., Kristina Thorden, Ornskoldsvik, 1,390 bls. dry sulphite pulp.

IMPORTS AT BOSTON

Weeks Ending Feb. 17 & 24

F. H. Paul & Stein Bros., Aagtedyk, Rotterdam, 200 bags casein.

Cellulose Sales Co., Venezuela, Ostrand, 4,200 bls. sulphate pulp, 1,500 bls. sulphite pulp.

Cellulose Sales Co., Venezuela, Sundsvall, 6,600 bls. sulphate pulp, 1,500 bls. sulphite pulp.

(———), K. C. Rogenaes, Rotterdam, 547 bls. sulphite pulp.

Gottesman & Co., Cali, Gothenburg, 2,540 bls. unbleached kraft pulp.

J. A. Conkey, American Packer, Liverpool, 31 bls. gauze carbonizing tissue.

(———), Exporter, Trieste, 737 bls. chemical pulp.

China American Paper & Pulp Co., Exporter, Trieste, 300 bls. chemical pulp.

(———), Exporter, Trieste, 62 rolls packing paper.

Elliott Addressing Machine Co., American Press, Kobe, 13 cs. stencil paper.

IMPORTS AT PHILADELPHIA

Weeks Ending Feb. 17 & 24

(———), Lista, Rouen, 50 bls. rags, 21 bls. old cotton rags.

(———), Cornerbrook, Cornerbrook, 3,452 rolls newsprint.

Gottesman & Co., Inc., Kristina Thorden, Sundsvall, 3,000 bls. sulphite pulp.

Pagel, Horton & Co., Inc., Kristina Thorden, Karskar, 2,235 bls. woodpulp.

Pagel, Horton & Co., Inc., Kristina Thorden, Ornskoldsvik, 9,116 bls. sulphite pulp.

Castle & Overton, Inc., American Traveler, Glasgow, 105 bls. paperstock.

J. T. Flannery, Hado County, Antwerp, 78 bls. rags.

E. J. Keller Co., Inc., J. Maersk, Havre, 61 bls. rags.

Bank of N. Y. Trust Co., Domfront, Bordeaux, 104 bls. old rags.

A. L. Feierman, Exilona, Alexandria, 125 bls bagging.

(———), Exilona, Alexandria, 26 bls. rags.

J. H. Schroeder Banking Corp., Exilona, Trieste, 525 bls. woodpulp.

Philadelphia Inquirer, S. Thorden, Hallstavik, 424 rolls newsprint.

Madden Reeve Angel & Co. Inc., Mormacwave, Hango, 1488 rolls newsprint.

J. Madden Corp., Mormacwave, Hango, 104 rolls woodpulp boards.

Pulp Sales Corp., Mormacwave, Hango, 813 bls. woodpulp.

Madden Reeve Angel & Co., Inc., Sparreholm, Kotka, 283 rolls newsprint.

Parsons & Whittemore, Inc., Sparreholm, Gothenburg, 156 bls. wallboard.

Pulp Sales Corp., Sparreholm, Kotka, 665 bls. unbleached sulphate pulp, 1,700 bls. unbleached sulphite pulp.

Hemphill & Co., Tudor, Hang Kong, 120 bls. old bag waste.

Giant & Co., Excelsior, Madras, 76 bls. jute rags.

Elof Hansson, Inc., Exporter, Trieste, 1,870 bls. chemical pulp.

Pagel Horton & Co., Inc., S. Thorden, Ornskoldsvik, 7,559 bls. sulphate pulp, 2,844 bls. dry sulphite pulp.

A. L. Diament & Co., St. Bertrand, Havre, 38 cs. wallpaper.

IMPORTS AT NORFOLK

Weeks Ending Feb. 17 & 24

D. Benedetto, Lista, Havre, 76 bls. old bagging.

A. de Vries Trading Corp., Lista, Rouen, 56 bls. scrap bagging.

(———), Cornerbrook, Cornerbrook, 2,751 rolls newsprint.

National City Bank, Nyhaug, Leghorn, 67 bls. scrap bagging.

A. de Vries Trading Corp., Nyhaug, Genoa, 67 bls. scrap bagging.

Lounar Textile By-Products, Nyhaug, Genoa, 90 bls. old bagging.

Castle & Overton, Inc., Domfront, Bordeaux, 126 bls. old rags.

A. de Vries Trading Corp., Aagtedyk, Rotterdam, 57 bls. old scrap bagging.

(———), Steel Artisan, Bombay, 111 bls. old jute bags.

Castle & Overton, Inc., Steel Artisan, Bombay, 100 bls. hessian rags.

A. de Vries Trading Corp., Sea Leader, Rotterdam, 132 bls. old bagging.

F. P. Gaskell Co., American Packer, Liverpool, 50 cs. cigarette paper (cork tips).

China American Paper & Pulp Co., Exilona, Palamos, 300 bls. chemical pulp.

(———), Exilona, Leghorn, 53 bls. waste bagging.

American Viscose Co., American Packer, Liverpool, 1 cs. tissue paper.

C. H. Sprague & Son, Cape Nome, Rotterdam, 6 bls. scrap bagging.

AMERICAN PAPER AND PULP ASSOCIATION'S PAPER PRODUCTION RATIO REPORT

(Production as per cent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

	Jan. 20	Jan. 27	Feb. 3	Feb. 10	Feb. 17
1951	101.8	101.2	100.3	98.2r	103.1
	Jan. 21	**Jan. 28**	**Feb. 4**	**Feb. 11**	**Feb. 18**
1949	94.5	94.0	93.4	96.3	95.0

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1950	92.6	95.6	96.7	95.4	96.4	97.7	85.3	99.6	96.2‡	101.2‡	100.3‡	93.7‡	95.8‡
1951	99.5‡												

‡ Preliminary.
r Revised.

COMPARATIVE YEARLY SUMMARIES

	1944	1945	1946	1947	1948	1949	1950	1951
Year to Date	88.6	87.8	93.6	104.7	100.4	94.5	99.8	100.0
Year Average	88.1	89.4	100.1	104.3	96.2	88.6	92.9‡	

PAPERBOARD OPERATING RATIOS†

	Jan. 20	Jan. 27	Feb. 3	Feb. 10	Feb. 17
1951	104	104	103	104	105
	Jan. 21	**Jan. 28**	**Feb. 4**	**Feb. 11**	**Feb. 18**
1950	92	92	91	93	92

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1950	88	92	91	92	91	94	82	100	96	102	101	95	94
1951	102												

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

Note: The chart shows the ratio through December 1950 on the basis of 6-day capacity. Beginning with January 1951 the ratio is shown on the new basis of normal 6- and 7-day capacities. Corresponding weekly and monthly ratios for 1950 on the new basis, shown in the tables above, are somewhat lower.

Paperboard operating ratios continue on the basis of a 6-day week.

† Per cents of operation based on "inch-hours" reported to the National Paperboard Association.

A. de Swaan, Cape Nome, Rotterdam, 77 bls. scrap bagging.

Textile & Paper Supply Co., Cape Nome, Rotterdam, 59 bls. jute rags.

E. J. Keller Co. Inc., Excelsior, Alexandria, 242 bls. old bagging.

Castle & Overton, Inc., Excelsior, Tuticorin, 100 bls. old bagging.

Bunal & Binch, Excelsior, Calcutta, 315 bls. old jute rags.

National City Bank, E. Bakke, Bombay, 500 bls. old jute bags.

1st National Bank of Boston, Exporter, Venice, 69 bls. old jute bagging.

China American Paper & Pulp Co., Exporter, Trieste, 631 bls. chemical pulp.

Gottesman & Co., Bullaren, Gothenburg, 254 bls. unbleached kraft pulp.

IMPORTS AT BALTIMORE

Weeks Ending Feb. 17 & 24

Cellulose Sales Co., Venezuela, Ostrand, 600 bls. sulphate pulp, 600 bls. sulphite pulp.

Pagel, Horton & Co., Inc., Kristina Thorden, Oruskoldsvik, 450 bls. dry sulphite pulp, 1,371 bls. sulphate pulp.

Price & Pierce, Ltd., Kristina Thorden, Oruskoldsvik, 150 bls. dry chemical pulp.

Gottesman & Co., Inc., Kristina Thorden, Sundsvall, 1,500 bls. unbleached kraft pulp, 3,000 bls. sulphite pulp.

S. Shapiro & Son, American Clipper, London, 66 bls. paperstock, 61 bls. cotton rags.

E. J. Keller Co., Inc., J. Maersk, Havre, 35 bls. old cotton rags.

Castle & Overton, Inc., J. Maersk, Antwerp, 70 bls. old cotton rags.

E. J. Keller Co., Inc., J. Maersk, Rouen, 49 bls. cotton rags.

Gottesman & Co., Tidaholm, Iggesund, 2,135 bls. semi-bleached kraft pulp.

Cottman Co., Sea Leader, Havre, 60 bls. cotton rags.

Plywood & Door Manufacturing Co., Mormacwave, Hango, 450 bls. wallboard.

Jay Madden Corp., Mormacwave, Hango, 151 rolls sulphate wrapping paper, 311 rolls woodpulp boards.

Pagel Horton & Co. Inc., S. Thorden, Ornsholdsvik, 6,870 bls. sulphate pulp, 5,034 bls. sulphite pulp.

Pulp Sales Corp., Sparrebolm, Kutka, 2,430 bls. sulphate pulp, 1,516 bls. sulphite pulp.

(———), Exilona, Trieste, 172 bls. cotton rags.

China American Paper & Pulp Co., Exilona, Trieste, 965 bls. chemical pulp.

S. Shapiro & Son, Cape Nome, Rotterdam, 37 bls. rags.

China American Paper & Pulp Co., Exanthia, Trieste, 450 bls. chemical pulp.

China American Paper & Pulp Co., Exporter, Trieste, 471 bls. chemical pulp.

(———), Faria, Marseilles, 275 bls. cotton rags.

OBITUARIES

Sydney S. Rogers, 80, who had served as vice-president of the Chemical Paper Manufacturing Co., Holyoke, Mass., for the 13-year period from 1913 to 1926, died recently.

Mr. Rogers was, at the time of his death, a West Coast representative for that company, having assumed this post after leaving the local plant.

Mr. Rogers had been associated with the paper industry the greater part of his life. As a young man he was connected for a number of years with the American Writing Paper Corp., leaving this firm when he took the vice-presidency of the Chemical Paper Manufacturing Co.

Judge Henry L. Harrington, 80, presiding justice of the Adams District Court, and organizer of the former Berkshire Hills Paper Co., died February 14 of coronary thrombosis.

H. H. Straus, 67, president and chairman of the board of Ecusta Paper Corp., died of a heart attack at his home on February 27.

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CHEMICAL PULP MILL ENGINEERS
500 WOOLWORTH BUILDING
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Associated with CHEMIPULP PROCESS LTD., Montreal, Quebec

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Photoelectric REFLECTION METER

for accurate measurement of

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Gloss and Color

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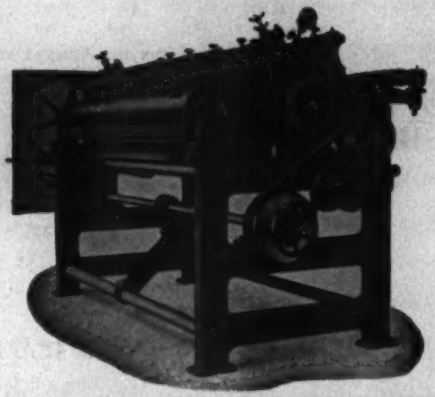

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M-2

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POSITIONS OPEN

We can place—superintendent Fourdrinier and Cylinder paper mill, salary $7500-$8000 yr.; supts. and asst. supts., and foremen for bag factories; asst. gen. mgr. Cylinder machine specialty mill, salary $6500 to $7500; coating foremen $4,000-$6,000. Purchasing Agent; Chemical Engineer for Group Leader in Research Department.

Chemical engineers, chemists and laboratory men, one chemist for tissue and deinking; mechanical or civil engineer, $400-$500 month; mechanical engineer for coating machines for coating paper and fabrics; designers and draftsmen for firms building paper mill machinery; master mechanics; Cylinder and Fourdrinier machine foremen, machine tenders and back tenders; machinery salesmen; beater engineer Fourdrinier machine felt mill.

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SPECIALISTS IN PLACING PULP AND PAPER MILL EXECUTIVES M-2

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Paper converting, nationally known. Printing, coating, gumming, laminating, finishing operations. Lifetime position for top-flight production executive. Our people know of this ad Send full details confidentially to President, Box 50-443, care Paper Trade Journal. TF

SALARIED POSITIONS $3,500 to $35,000. We offer the original personal employment service (established 41 years). Procedure of highest ethical standards is individualized to your personal requirements. Identity covered; present position protected. Ask for particulars. R. W. BIXBY, INC. —117 Dun Bldg., Buffalo, 2, N. Y. TF

WORKING SUPERINTENDENT for small, fast growing Eastern mill making lightweight specialties. Cylinder machine experience essential. State qualifications and salary expected. Address Box 51-86 care Paper Trade Journal. TF

MASTER MECHANIC for tissue mill. Write or call Seamen Paper Company, Otter River, Massachusetts. M-2

WANTED — SALES ENGINEER — Experienced in Pulp and Paper Mills, for sales and service work. Excellent opportunity with old established machinery manufacturer. In reply, give resume of education, experience and current salary. Address Box 51-86 care Paper Trade Journal. TF

EXPERIENCED PAPER MACHINERY DESIGNER with special knowledge of reels, winders and cutters. Excellent opportunity with well established company. Address Box 51-49 care Paper Trade Journal. TF

WANTED — Experienced back tender for mid-western Kraft Specialty mill. Six to seven days per week operation. Time and one half for Saturday, Double time for Sunday. Address Box 51-52 care Paper Trade Journal. M-2

WANTED — Two backtenders for folding grades. Steady job; Good pay. Seven days per week. Time and a half for Saturday; Double time for Sunday. Morris Paper Board Co., 177 Third Ave., Paterson, N.J. M-2

WANTED—TOP GRADE MAN fully experienced, for manager of an eastern chipboard mill. Furnish details of experience and references. Excellent opportunity. Address Box 51-78 care Paper Trade Journal. TF

ENGINEER—with machine shop experience wanted in Paper Converting Plant within 25 miles of New York City to take charge of existing equipment and ability to design and help build new equipment. Address Box 51-73 care Paper Trade Journal. M-2

UNIVERSITY GRADUATE with knowledge of theoretical and practical aspects of cooking and bleaching Kraft pulp wanted by Midwestern paper mill making fine papers. Address Box 51-69 care Paper Trade Journal. M-9

TOUR BOSS for position in mill manufacturing board. Steady employment, rotating shifts. Mill in Massachusetts. Give full details in reply. Address Box 51-67 care Paper Trade Journal. M-2

CHEMIST—With Box Board Mill experience for mill located near Chicago. State experience, age and salary expected. Reply to Mr. A. J. Barrett, NATIONAL BISCUIT COMPANY, 449 West 14th Street, New York, 11, N. Y. M-2

WANTED—25 experienced paper mill Design and Layout Engineers. Men required for steel and concrete structural design, mechanical layout, piping design, and electrical design. In first letter give complete engineering experience, age, education, etc. Address Construction Engineer, P. O. Box 1844, Savannah, Ga. A-13

TWO Machine Tenders and one Master Mechanic wanted for 40" Cylinder Machine. Apply TRENTON PAPER COMPANY, 1600 New York Ave., Trenton, N.J. M-9

SITUATIONS WANTED

FOREMAN with many years practical experience converting papers for all purposes desires connections with reliable concern. Middle aged. Can handle help for best results. Address Box 51-31 care Paper Trade Journal. M-9

PAPER MILL SUPERINTENDENT TWENTY-FIVE YEARS OF PRACTICAL EXPERIENCE manufacturing folding boxboard, writing, book, tweeting, sulphite specialties, groundwood specialties, kraft specialties. Well experienced in stock preparation for above grades. Run mill economically. Best of references. Address Box 51-60 care Paper Trade Journal. M-9

BAG SUPERVISOR and Maintenance — 25 years practical experience in various types bag equipment. Can handle help, get quality and production. References. Age 47. Address Box 51-64 care Paper Trade Journal. M-2

MASTER MECHANIC—25 years experience in maintenance and construction; steam engineering. Age 44. Addres Box 51-84 care Paper Trade Journal. M-16

Eight years experience in DIRECTING RESEARCH paper converting, synthetic coatings, functional papers, ordnance papers, food wraps, extrusion, ideas, pat. pend., broad background, peace and war items. Seeking new connection to direct research with medium sized company. Address Box 51-47 care Paper Trade Journal. M-2

YOUNG MAN—Single, age 30, wishes to establish connection with mill or merchant offering opportunity for advancement in sales. Diversified mill experience in Book, and Printing papers. Capable secretary and stenographer. Veteran. Address Box 51-91 care Paper Trade Journal. M-9

YOUNG GRADUATE—New York State College of Forestry, 1½ years experience Quality Control and Development Work with Specialty Mill. Desires change for greater opportunity. Address Box 51-92 care Paper Trade Journal. M-9

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PAPER COATING MACHINERY MANUFACTURERS — Waxing, Oiling, Carbon Laboratory Coating and Treating and Flat Ream Measuring and Converting Machines. New improvement. THE MAYER MACHINE COMPANY, INC., 1313 Buffalo Road, Rochester, 11, N. Y. TF

FOR SALE—Leather Belt, heavy triple 29" wide x 96' 2". Excellent condition. Address Box 51-65 care Paper Trade Journal. M-2

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Paper Machines, Paper Mill Machinery and Converting Equipment.

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2—Dilts 750 lb. Iron Tub.

BELTING—NEW
37 feet 5" 15 ply Goodyear Rubber Belting.
150 feet 6" 4 ply Silver Steel Transmission belt.

CALENDER ROLLS
46 Chilled Iron Rolls—Assorted sizes.

CONVEYOR
1—10½ ft. long x 30" wide—with motor.

CORE CUTTERS
1—Cameron with 2" x 1½" mandrels.

COUCH ROLLS—Rubber
1—18" face x 20" diameter. New.

CYLINDER MOLDS
1—134" face x 30" diameter, with stainless steel shafts.

DRIVES—ENCLOSED HERRING BONE GEAR
1—Falk right angle 75 hp—ratio 6.91-1.
1—Falk right angle 150 hp—ratio 7.14-1.
1—Falk straight 200 hp—ratio 1.92-1.
1—Falk straight 100 hp—ratio 5.15-1.
Above complete with clutch pulleys.

DRYERS
3—124" face x 48" diameter.
1—60" face x 36" diameter.
1—72" face x 60" diameter—with gear.
1—130" face x 19" diameter—Baby Dryer.
2—120" face x 42" diameter.
1—60" face x 36" diameter.
1—102" face x 48" diameter, with bearings.
3—100" face x 48" diameter—with gears and bearings.
3—120" face x 42" diameter with bearings and gears.
1—112" face x 48" diameter.
1—84" face x 36" diameter.

FILTER PRESS
1—New Sperry filter press, size 12, type 41.

FILTERS
2—Oliver Vacuum Filters, Cylinder 10' face x 9'9" diameter. Steel vats. 1200 GPM capacity.

FLAT SCREENS
3—8 plate Sandy Hill Roller Shoe with scrapers.
1—Harmon 12 plate.
1—Sandy Hill 12 plate roller shoe.

FOURDRINIER SECTIONS
1—P & J 100" x 80 ft. ball bearing. Complete from inlet to 22" diameter suction couch. Brass and rubber covered table rolls. 6 Bronze Suction Boxes operated at 1500' per minute.

JORDANS
1—96 Niagal, for motor drive.
1—Jones Majestic with base and couplings—
3—72 Appleton with base and coupling.
1— Jones Majestic. Stainless Steel Plating.

LAMINATOR
1—Downingtown 52" Laminator, with 4 Dryers 48" diameter.

MOTORS
1—General Electric 150 h.p. vertical motor—1200 r.p.m., 440 v., 3 phase, 60 cycle.
1—G. E. 75 h.p. vertical motor, 1200 r.p.m., 440 v., 3 phase, 60 cycle.

PULP EQUIPMENT
1—Nitts & Merrill #17 Pulpwood chipper.
1—Bird ball bearing Pulp Screen. Practically new. Used 6 months.
4—APMEW Ball Bearing Pulp Screens—80 ton capacity.

PULPERS
3—42 Lamoye with enclosed Falk Drives. New.

PUMPS
44—Centrifugal Pumps, open A, closed impellers. Direct connected or Belt Drives. Extended base for motor. Assorted capacities and heads. Most used less than one year. Also new Goulds Pumps.

REDUCERS
1—Link Belt 40 h.p. Ratio 2.2-1, 900 r.p.m.-327 r.p.m.

REFINERS
1—Sprout, Waldron, with 400 HP, 440 volt, 3 phase, 60 cycle motor and starter—Practically new.

ROLLS—PRESS, COUCH, etc.
22—Press rolls, brass and rubber covered.
14—Couch rolls, brass and rubber covered.
250—Brass and steel carrying rolls.

ROTARY SCREENS
4—52A Bird, fully rebuilt with new vats, plates, etc.—sectional drive.
1—52 Bird—stainless steel vat.
1—52 Bird—iron vat.

SAVEALLS
2—Oliver, Vacuum type cylinder 120" face x 60" diameter, with steel vats.

SCREW PRESSES
1—Valley Voith Screw Press Size 2.

SHEETERS
1—28" Kidder Cyel Sheeter.
1—60" Duplex Dilion with 20 reel Stack Stand.

SHREDDERS
1—American 27" Hammermill, anti-friction bearings.
1—Sprout Waldron Cutter—type F-11—30" knives. Used 30 days.

SLITTERS AND WINDERS
1—Pusey & Jones 100" high speed slitters and rewinders.
1—Cameron 60" Model C.
1—Kidder 120" Paper Machine Slitter and Winder —32" rewind.
1—Moore & White 120" Four Drum Paper Machine Slitter and Winder—32" rewind.
1—Beloit 120" Paper Machine Slitter and Rewinder—32" rewind.

STOCK PUMPS
2—Beloit 10 x 20 Triplex with steel Link Belt Chain Drives.
1—Shartle 10 x 20 Duplex.

STUFF PUMPS
1—Shartle 16 x 20 Triplex.

SUCTION COUCH ROLLS
1—Millspaugh 22" diameter x 130¾" cradle face.
1—Millspaugh 22" diameter x 120" drilled face.
1—Beloit 22" face x 10" diameter—Ball bearing.

SUCTION PRESS ROLLS
1—Millspaugh 131" drilled face x 22" diameter with stand & drive.

THICKENERS
1—Bird Thickener Iron End Vats—Cylinder 72" face x 42" diameter, with Shower and Felt take off roll.
1—Wood Thickener Cylinder 60" x 30" with shower and doctor. Gear head motor drive. Used 2 months.

WATER FINISH UNIT
1—Valley Micronist Unit for water finish on paper—120" double.

WAXING MACHINE
1—Waldron 60" Waxer and Impregnator.

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REBUILT ELECTRICAL MACHINERY

AC MOTORS (3 ph. 60 cy.)

HP	Make	Wdg	Spd.	Type
200	G.E.	S.C.	900	K
200	Al.Ch.	Syn.	900	
150	G.E.	S.C.	1800	LK
150	G.E.	Syn.	900	AYI
150	Westgh.	Syn.	900	3 Sy.
125	West.	S.C.	900	CS
125	West.	S.C.	720	
100	West.	S.C.	1800	
100	G.E.	Syn.	720	I M
100	Al.Ch.	S.C.	720	ARX
100(4)	West.	S.C.	1200	CS
75	West.	S.C.	720	CS
75	G.E.	S.C.	575	17L
50	A.C.	S.C.	1750	
50	West.	S.C.	1750	CS
40	G.E.	S.C.	1150	MT250
30	Al.Ch.	S.C.	900	AK
30	West.	S.C.	1720 (Eoc.)	CS400
25	G.E.	S.C.	1150	1 K
20	Vert. G.E.	S.C.	1160	KT200
25	200 v. West.	S.C.	1750	CS200
25	Gr.Wh.	S.C.	900	

HP	Make	Wdg	Spd.	Type
25	West.	S.C.	1730	CS
25	West.	S.C.	1200	CS
20	Al. Ch. (Sour)	S.C.	(Hi-Torq) (400)	ARWHC
20	West.	S.C.	1730	CS
15	West.	S.C.	1760	CS525
15	West.	S.C.	575	CS525C
10(3)	Al.Ch.	S.C.	575	ARY
10	West.	S.C.	1200	CS275C
7½(3)	Al.Ch.	S.C.	570	ARY
7½	G.E.	S.C.	1200	KT
7½	West.	S.C.	3440	CS254Y
5	West.	S.C.	1200	CS
3/1½	L.A.	S.C.	900/1800	250A
3	Master	S.C.	1150/37	PA
3	Burke	S.C.	420	EM3
3	West.	S.C.	1730	
3	220v. West.	S.C.	1750	CS234

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3—25 KVA WEST. 2200v. 120/240v.
1—15 KVA. G.E. 2200v.-110/220v.
1—200 KVA. Penna. 2400v.-240 v.
3—200 KVA. G.E. 2200v.-208/400v.

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48" Kidder Sheeter with layboy; 6" Brightwood; 29" x 30" & 28" x 41" Thomson Platen Die Cutters.
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1—42" type 10—Model 5.
1—32" type 8—Model 5.
1—40" type 40.
1—32" type 40—Model 2A.
1—32" type 24—Model 3A Duplex.

OTHER SLITTERS

1—36" Langston Center Wide Duplex S&R.
1—30" Langston Type A Shear-Cut S&R.

POWER PAPER CUTTERS

8—Seybold: 38", 54" and 64" 20th Century, 50" 102, 40" 82, 50" Precision with Auto-spacer, 50" Dayton; 54" Holyoke; 5—Oswego: 38", 44" and 57"; 1—Sheridan 50"; 1—Dexter: 57"; 2—Acme: 32" and 42"; 1—S&W Under Cut 63".

1—21" Waldron experimental sheet fed roll coater.

1—48" Mayer Coating Machine Co.'s gumming machine for Kraft paper.

1—Paper Converting Machine Co. ¼ fold, 3 web napkin folder with embossing attachment.

2—Hudson Sharp, 3 desk napkin folders 10" x 10", with embossing attachments.

2—Lockport Flat & Square Bag Machines. One #2, one #3.

1—20" Champlain 4-color Rotogravure Press.

1—32" 3-color Baggrint Machinery Corporation's Anilina Printing Press for tail-printer on Bag Machine.

1—80" Single Hamblet Sheeter, 8 roll double deck backstands, Slitting attachment and automatic overlapping delivery. Erie Layboy with blower and static eliminator. Automatic inserting rear counter.

1—102" Beloit Duplex Rotary Sheeter, 10 roll backstands and M&W Layboy.

2—Duplex Sheeters, 1—64" Dillon and 1—94" Moore & White.

1—40" Norwood plater. AC reversing motor equipment.

1—45" German, Dornbusch Embossing machine with two sets of embossing rolls.

1—38" Holyoke Roll to Roll Embosser. Heavy Type.

1—42" Hobbs Mfg. Co.'s Embosser, ball bearing throughout.

1—60" Shartle & Bevis Waxing Machine. Vacuum type water removal unit. Variable speed AC motor drive.

3—Potdevin Squeeze Roll Waxing Machines, one 80", one 52" and one 84" wide.

1—14" x 28" Meisel, R.P.B. & P. Press, with all attachments for continuous register forms.

1—46" 6 Roll, 1—67" 9 Roll and 1—84" 9 Roll Holyoke Super Calender Stacks.

1—48" Robinson Rotary Card Cutter.

1—1000# Iron Tub Beater. Roll 48"x48"—72 bars.

3—#2 Moore & White Screens. Plates cut .070".

1—Lannoye Pulper.

5—14' diameter Globe Rotary Cookers.

1—3 color 36" by 60" Meisel roll to sheet adjustable Rotary Press.

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Reply to Room 903
21 East 40th St., New York 16, N. Y.
M-2

FOR SALE

CURRENT OFFERINGS

42" Moore & White Sheeter, with or without layboy.
45" Beck Sheeter with layboy.
58" Finley Sheeter.
84" Hamblet Sheeter, only 6 yrs. old, with 8 roll Back Stand.
100" Horne single knife Sheeter.
68" Oswego mill type Power Cutter, with power back gauge.
Morrison #4 and 32 L. G. Box Stitchers.

(Send for Current List.)

THOMAS W. HALL COMPANY, Inc.
120 West 42nd St., New York 18
(Plant at Stamford, Conn.) TF

FOR SALE—1—Hayssen Napkin Wrapping Machine for wrapping with cellophane one size package 6½" wide, 2¾" high and 6¼" long, machine number 9963, brand new, never been used, price $6,500.00 net fob our mill. Address Box 51-75 care Paper Trade Journal. M-9

FOR SALE—2A Bird Screen, Emerson Jordan, 89" calender stack. Seaman Paper Company, Otter River, Massachusetts. M-2

FOR SALE—One Bagprint B-10 flat end square bag machine, mfg. size 3x5 to 8½x18. Can presently be seen in operation. Address Box 51-97 care Paper Trade Journal. M-10

WANTED

WANTED

Serviceable Grocery Bag Machine
8 through 20 lb. sizes.
Recent Model Potdevin preferred.

Address Box 50-450, care Paper Trade Journal. TF

WANTED—Brightwood Box Machine, Shredders, Evaporators, Generators and Boilers. Slitters, Cutters. Hydraulic presses. Sheridan Presses, Dryers. Address Box 51-88 care Paper Trade Journal. TF

WANTED—W & P Shredders, Evaporators Generators and Boilers, Slitters, Cutters. Hydraulic presses. Sheridan Presses, Dryers. Address Box 51-89 care Paper Trade Journal. TF

WANTED—1—72" Asphalt Laminating Machine. Give full details and price. Address Box 51-74 care Paper Trade Journal. M-9

WANTED—TOILET TISSUE—Jumbo Rolls (Bleached and unbleached) in carload lots. Address Box 51-16 care Paper Trade Journal. TF

WANTED—Spiral Tube Winding Equipment including Automatic Cut-off Saws, etc. Address Box 51-81 care Paper Trade Journal. M-2

WANTED—Wet Machine—any size. Address Box 51-90 care Paper Trade Journal. M-9

WANTED
WAXING MACHINE

State Particulars.

CONTACT BLEYCO PAPER CORP.
419 West 55th Street, New York 19, N. Y.
Telephone Plaza 7-6380
M-9

WANTED

WANTED TO BUY
SULPHATE PULP MILL

Advise full details

Box 51-93 care Paper Trade Journal. M-2

WANTED—Paper for gypsum board and lath. Any quantity from 10 to 500 tons or regular monthly shipments. Address Box 51-85 care Paper Trade Journal. M-16

WANTED—One 40" Waxer, either Hudson Sharp or Mayer with or without chill unit. Address Box 51-98 care Paper Trade Journal. M-16

KRAFT PAPER WANTED in Jumbo Rolls 30-35-40-45 basis weights. Carloads or less. Please send quote and samples. Address Box 51-94 care Paper Trade Journal. M-2

GOVERNMENT BIDS

PROPOSALS
FOR FURNISHING
PAPER FOR THE U. S. GOVERNMENT PRINTING OFFICE

SEALED PROPOSALS will be received until 10 a.m., March 12, 1951, in the room of the Joint Committee on Printing, in the Capitol, Washington, D.C., for furnishing the paper for the public printing and binding, and blank paper for the use of the Government departments and establishments in the District of Columbia, for the term of three months, beginning April 1, 1951; deliveries to be f.o.b. Government Printing Office Warehouse, or warehouse siding, Washington, D.C. The proposals will be opened in the presence of and the award of contracts made by the Joint Committee on Printing to the lowest and best bidder for the interest of the Government whose bids are in conformity with the requirements of the proposal. The Committee reserves the right to reject any or all bids, or to accept any bid or any part and reject the other part, if, in its opinion, such action would be in the interest of the Government.

Blank proposals containing the instructions, schedules, and specifications may be obtained by addressing John J. Deviny, Public Printer, Washington 25, D.C.

Contracts will be entered into for supplying the quantities required, whether more or less than the estimates, as provided in paragraph 8 of the instructions.

The approximate estimated quantities set forth in detail in the schedule comprise:

PAPER

1,000,000 pounds newsprint paper; 2,250,000 pounds machine-book paper; 220,000 pounds English-finish book paper; 30,000 pounds machine-finish book end paper; 4,900,000 pounds offset book paper; 240,000 pounds antique book paper; 380,000 pounds water resistant (text) book paper; 700,000 pounds supercalendered book paper; 2,054,000 pounds coated book paper; 1,620,000 pounds mimeograph paper; 380,000 pounds duplicator copy paper; 10,010,000 pounds writing paper; 1,325,000 pounds map paper; 385,000 pounds manifold paper; 2,260,000 pounds bond paper; 710,000 pounds ledger paper; 960,000 pounds index paper; 120,000 pounds cover paper; 190,000 pounds manila paper; 385,000 pounds kraft paper; 250,000 sheets gummed paper; 30,000 pounds blotting paper; 10,000 pounds wallet board; 90,000 pounds tag board; 15,000 pounds cardboard; 10,000 sheets litho-coated one-side cardboard; 45,000 sheets railroad board; 110,000 pounds wood cardboard; 200,000 pounds tan board; 7,580,000 pounds postal card paper; 100,000 sheets pressboard; 150,000 pounds newsboard; 55,000 pounds binder's board; 140,000 pounds chestnut cover board.

By direction of the Joint Committee on Printing.

JOHN J. DEVINY,
Public Printer.

WASHINGTON, D. C.
February 19, 1951. M-9

WHERE TO BUY

ABRASIVES
Monsanto Chemical Co.
Norton Co.

ADHESIVES
American Cyanamid Company
Plastics & Resins Division
E. I. Du Pont De Nemours & Co., Inc.
The Goodyear Tire & Rubber Company
Monsanto Chemical Co.
Morningstar, Nichol, Inc.
National Starch Products, Inc.
Nopco Chemical Co.
Stein, Hall & Co., Inc.

AGITATORS
American Paper Machy. & Engrg. Works, Inc.
Appleton Machine Co.
The Cowles Company
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
D. J. Murray Mfg. Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Valley Iron Works Co.
Shartle Brothers Machine Co.

ADJUSTABLE SHAKE MOTION
Manchester Machine Co.

ADJUSTABLE TILTING MOTOR BASE
Lovejoy Flexible Coupling Co.

ALLOYS
Michigan Steel Casting Co.

ANTIFOAM
American Cyanamid Company
Industrial Chemicals Division
National Aluminate Corp.
Nopco Chemical Co.

APRON CLOTH
Williams-Gray Co.

BAG MACHINES
Dilts Machine Works
Potdevin Machine Co.
The Sandy Hill Iron & Brass Works
Smith Winchester Mfg. Co.
Weber, Herman G., & Co., Inc.

BALL MILLS
F. L. Smidth & Co.

BARK BURNER
Combustion Engineering-Superheater, Inc.
Nichols Engrg. & Research Corp.

BARKERS AND CHIPPERS
Allis-Chalmers Mfg. Co.
Appleton Machine Co.
Carthage Machine Co.
D. J. Murray Mfg. Co.
Valley Iron Works Co.

BARS
Dilts Machine Works
E. D. Jones & Sons Co.
The Moore & White Co.
Shartle Brothers Machine Co.
Valley Iron Works Co.

BASIC WEIGHT SCALES
Thwing-Albert Instrument Co.

BEARINGS
The Bagley & Sewall Company
Black Clawson Company
E. D. Jones & Sons Co.
Link Belt Company
Magnus Metal Corp.
The Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
SKF Industries
Stephens-Adamson Mfg. Co.
Timken Roller Bearing Co.
Valley Iron Works Co.

BEATERS AND JORDANS
American Paper Machy. & Engrg. Works, Inc.
The Appleton Machine Co.
Black Clawson Company
Dilts Machine Works
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Madden Machinery Co.
J. J. Ross Company
Ross Paper Machy. Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

BED PLATES
Bahr Brothers Mfg. Co.
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Farrel-Birmingham Co., Inc.
E. D. Jones & Sons Co.
Lukenweld Div., Lukens Steel Co.
Shartle Brothers Machine Co.
Valley Iron Works Co.

BELTING
Allis-Chalmers Mfg. Co.
Goodrich, B. F., Co.
The Goodyear Tire & Rubber Company
Link Belt Company

BIN DISCHARGERS
Stephens-Adamson Mfg. Co.

BLEACHING AGENTS
E. I. Du Pont De Nemours & Co., Inc.
General Dyestuff Corp.
Rohm & Haas Co.
Virginia Smelting Co.

BLEACHING APPARATUS
E. D. Jones & Sons Co.
Perkins & Sons, Inc., B. F.
Moore & White Co.
Niagara Alkali Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

BLOW PIPES & PITS
Carthage Machine Co.
Kalamazoo Tank & Silo Co.
Moore & White Co.
Murray Mfg. Co., D. J.
Walworth Company

BOILERS
Babcock & Wilcox Co.
Combustion Engineering-Superheater, Inc.

BOTTOMS
Kalamazoo Tank & Silo Co.
Valley Iron Works Co.

BOXBOARD SCALES
Thwing-Albert Instrument Co.

BRUSH ROLLS
M. W. Jenkins Sons, Inc.

BRUSHES
M. W. Jenkins Sons, Inc.
Otto Reidel & Son

BURSTING TESTERS
B. F. Perkins & Son Inc.
Testing Machines, Inc.

CALENDERS
The Bagley & Sewall Company
Black Clawson Company
Downingtown Mfg. Co.
Farrel-Birmingham Co., Inc.
Lobdell Co.
Edward J. McBride
The Moore & White Co.
Perkins & Sons, Inc., B. F.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

CARRIER ROPE
Williams-Gray Co.

CASEIN
American Cyanamid Co.
Industrial Chem. Div.
Bunge Pulp & Paper Co.
Lauhoff Powder Co.

CASTINGS
Appleton Machine Co.
The Bagley & Sewall Company
Black Clawson Company
Babcock & Wilcox Co.
Carthage Machine Co.
Dilts Machine Works
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Hamblett Machine Co.
Lobdell United Co.
Magnus Metal Corp.
Michigan Steel Casting Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Walworth Company

CENTRIFUGAL MACHINERY
Bird Machine Co.
Nichols Engrg. & Research Corp.
Ross, J. O., Engrg. Co.
Shartle Brothers Machine Co.

CHAINS
Stephens-Adamson Mfg. Co.

CHEMICAL COTTON PULP
Hercules Powder Co.

CHEMICALS
American Cyanamid Co., Industrial Chem. Div.
Ansul Chemical Co.
Bunge Pulp & Paper Co.
Calco Chemical Co.
Calgon, Inc.
Dow Chemical Company
E. I. du Pont de Nemours & Co., Inc.
General Dyestuffs Corp.
Geigy Co., Inc.
B. F. Goodrich Chemical Co.
Gottesman & Co.
Hercules Powder Co.
Hooker Electrochemical Co.
The Kinsley Chemical Company
Monsanto Chemical Company
National Aluminate Corp.
Niagara Alkali Company
Nopco Chemical Co.
Pittsburgh Plate Glass Co., Columbia Chemical Division
Rohm & Haas Co.
Virginia Smelting Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

CHESTS
The Bagley & Sewall Company
E. D. Jones & Sons Co.
Kalamazoo Tank & Silo Co.
Shartle Bros. Mch. Co.

CLEANING MATERIALS
American Cyanamid Company
Industrial Chemicals Division
The Dow Chemical Company
E. I. du Pont de Nemours & Co., Inc.
General Dyestuff Corp.
Monsanto Chemical Company
Nopco Chemical Co.
Pittsburgh Plate Glass Co.
Wyandotte Chemicals Corp., J. B. Ford Division

CLUTCHES
Appleton Machine Co.
The Bagley & Sewall Company
Black Clawson Company
Farrel-Birmingham Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Shartle Bros. Mch. Co.
Stephens-Adamson Mfg. Co.

COATING MACHINERY
Dilts Machine Works
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
Hudson Sharp Machine Co.
The Mayer Machine Co., Inc.
Moore & White Co.
Potdevin Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corporation, John
Weber, Herman G., & Co., Inc.

COATING MATERIALS
American Cyanamid Company
Industrial Chemicals Division
E. I. Du Pont De Nemours & Co., Inc.
B. F. Goodrich Chemical Co.
The Goodyear Tire & Rubber Company
Hercules Powder Co.
J. M. Huber Corp.
Monsanto Chemical Company
Nopco Chemical Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

COGS
The N. P. Bowsher Co.

COMPLETE FOURDRINIER ROLL GRINDING
Manchester Machine Co.

COMPRESSORS
Allis-Chalmers Mfg. Co.
Nash Engineering Co.
Roots-Connersville Blower Corp.

CONDENSATE FILTERS
Hungerford & Terry, Inc.
The Permutit Company

CONSISTENCY REGULATORS
Askania Regulator Co.
Bird Machine Company
DeZurik Shower Company
Paper & Industrial Appliances

CONSTRUCTION CONTRACTORS
C. M. Guest & Sons

CONSULTING ENGINEERS
Birk, F. Paul
Black Clawson Company
Dilts Machine Works
Ebasco Services
Frank W. Egan & Co.
Alvin H. Johnson & Co., Inc.
Main, Inc., Chas. T.
The Ross Engrg. Co.
Shartle Bros. Mch. Co.
J. E. Sirrine & Co.
John Waldron Corp.
H. G. Weber & Co., Inc.

CONTINUOUS DIGESTER
Paper & Industrial Appliances

CONTROLLERS
Black Clawson Company
The Brown Instrument Co.

CONTROLS
The Brown Instrument Co.
Johnson Corp.
Foxboro Control Co.
Shartle Bros. Mch. Co.
Suckle Steam Specialties Co.

CONVERTING MACHINERY
The Bagley & Sewall Company
Egan, Frank W., & Co.
John Waldron Corp.
Dilts Machine Works
Hudson-Sharp Machine Co.

CONVEYORS
Black Clawson Company
Industrial Brownhoist Corp.
Murray, D. J., Mfg. Co.
Ross Engineering Corp., J. O.
Shartle Brothers Mch. Co.
Stephens-Adamson Mfg. Co.

CORES
Elixman Paper Co.
Rodney Hunt Machine Co.
Smith & Winchester Mfg. Co.
Sonoco Products Co.

CORROSION RESISTANT
Amercoat Corporation

COTTON LINTER
Railway Supply & Mfg. Co.

COUPLINGS
The Bagley & Sewall Company
Black Clawson Company
Farrel Birmingham Co., Inc.
E. D. Jones & Sons Co.
Lovejoy Flexible Coupling Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Thomas Flexible Coupling Co.
Valley Iron Works
Waldron Corp., John

CRANES
Cleveland Crane & Engrg. Co.
Industrial Brownhoist Corp.
Whiting Corp.

CURL TESTER
Thwing-Albert Instrument Co.

CUTTERS
The Bagley & Sewall Company
Black Clawson Company
Dilts Machine Works
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Harris-Seybold Co.
Jagenberg-Werke Akt. Ges.
Moore & White Co.
Perkins & Son, Inc., B. F.
The Sandy Hill Iron & Brass
Taylor, Stiles & Co.
Works
The Smith & Winchester Mfg Co.

CYLINDER MOULDS
Manchester Machine Co.

CYLINDERS
M. W. Jenkins Sons, Inc.

DAMPENERS
Perkins & Son, Inc., B. F.
Valley Iron Works Co.

DECKLE WEBBING
Williams-Gray Co.

DEFIBRATORS
American Defibrator Co.

DE-INKING
The Cowles Company
Dilts Machine Works
General Dyestuff Corp.
Kinsley Chemical Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

DEINKING CHEMICALS
E. I. Du Pont De Nemours & Co., Inc.
General Dyestuff Corp.
Kinsley Chemical Co.
Nopco Chemical Co.

DE-MINERALIZING EQUIPMENT
Hungerford & Terry, Inc.
The Permutit Company

DEMULSIFIERS
Wyandotte Chemicals Corp., Michigan Alkali Div.

DENSOMETERS
Bunge Pulp & Paper Co
W. & L. E. Gurley

DESIGN CONSTRUCTION
Rhaco Services

DETERGENTS
American Cyanamid Company Industrial Chemicals Division
Calgon, Inc.
General Dyestuff Corp.
Monsanto Chemical Company
Nopco Chemical Co.
Rohm & Haas Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

DEWAXING CHEMICALS
American Cyanamid Company Industrial Chemicals Division
General Dyestuff Corp.
Nopco Chemical Co.

DIFFERENTIAL SCALES
Thwing-Albert Instrument Co.

DIGESTERS
Babcock & Wilcox Co.
Chicago Bridge & Iron Co.
Combustion Engineering-Superheater, Inc.
Lukenweld
Pusey & Jones Corp.

DIGESTERS (Continuous)
Paper & Industrial Appliances

DISPERSING AGENTS
Calgon, Inc.
General Dyestuff Corp.
Monsanto Chemical Company
National Aluminate Corp.
Nopco Chemical Co.
Rohm & Haas Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

DOCTORS
The Bagley & Sewall Company
Bird Machine Company
Black Clawson Company
Downingtown Mfg. Co.
Lobdell United Co.
Lodding Engineering Corp.
The Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

DOCTOR BLADES
The Bagley & Sewall Company
Bird Machine Company
Lodding Engrg. Corp.
The Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

DRIERS
The Bagley & Sewall Company
Black Clawson Company
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
Lukenweld
The Moore & White Co.
Murray Mfg. Co., D. J.
T. J. Ross Company
Rad-Ray Mfg. Co., Inc.
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

DRILLED SUCTION COUCH ROLLS
Manchester Machine Co.

DRILLED SUCTION DRUM ROLLS
Manchester Machine Co.

DRIVES
Allis-Chalmers Mfg. Co.
Anderson Machine Co.
The Bagley & Sewall Company
Bird Machine Co.
Black Clawson Company
Dilts Machine Works
Downingtown Mfg. Co.
Fairbanks, Morse & Co.
Farrel-Birmingham Co.
General Electric Company
Gibbs-Brower Company, Inc.
Moore & White Co.
Murray, D. J., Mfg. Co.
Pusey & Jones Corp.
T. J. Ross Company
Ross Paper Machy. Corp.
The Sandy Hill Iron & Brass Works
Shartle Bros. Mch. Co.
Stephens-Adamson Mfg. Co.
Valley Iron Works Co.
Westinghouse Electric Corp.

DRUM WINDERS
Manchester Machine Co.

DRYER DRAINAGE
Stickle Steam Specialties Co.

DRYER ROLL PYROMETER
Thwing-Albert Instrument Co.

DUSTERS
Appleton Machine Co.
Downingtown Mfg. Co.
Frank W. Egan & Co.
W. W. Jenkins Sons, Inc.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
John Waldron Corp.

DUSTING BRUSHES
W. W. Jenkins Sons, Inc.

DYESTUFFS
American Cyanamid Company Calco Chemical Div.
Bunge Pulp & Paper Co.
Ciba Company
E. I. du Pont de Nemours & Co., Inc.
Geigy Co., The
General Dyestuffs Corp.
National Aniline Division, Allied Chemical & Dye Corp.

ELECTRIC HYGROMETER
Thwing-Albert Instrument Co.

EMBOSSING MACHINES
Dilts Machine Works
Egan, Frank W., & Co.
John Waldron Corp.

EMBOSSING ROLLS
The Appleton Machine Co.
Gibbs-Brower Company, Inc.
Northern Engraving & Mch. Co.
B. F. Perkins & Son, Inc.
John Waldron Corp.
Wheeler Roll Co.

EMULSIFIERS
General Dyestuff Corp.
Nopco Chemical Co.
Rohm & Haas Co.
Wyandotte Chemicals Corp.

ENZYMES
Rohm & Haas Co.
Vanderbilt Co., R. T.

EVAPORATORS
Davis Engrg. Corp.
Goslin-Birmingham Mfg. Co. Inc.
Murray, D. J., Mfg. Co.
Swenson Evaporator Co., Div. of Whiting Corp.

EXPANDERS
Mount Hope Machinery Co.

FANS
General Electric Co.
B. F. Perkins & Son, Inc.
Ross Engineering Co., J. O.

FEEDERS
Merrick Scale Mfg. Co.
The Permutit Company
Stephens-Adamson Mfg. Co.

FELTS
Appleton Woolen Mills
Asten-Hill Mfg. Co.
Draper Bros. Corp.
Huyck & Son, F. C.
Lockport Felt Co.
Morey Paper Mill Supply Co.
Shuler & Benninghofen
Waterbury Felt Co.
Waterbury, H., & Sons Co.
Williams-Gray Co.

FELT CLEANERS
Calgon, Inc.
General Dyestuff Corp.
Nopco Chemical Co.

FELT CONDITIONERS
Bird Machine Co.
The Sandy Hill Iron & Brass Works

FELT GUIDES
Black Clawson Company
Frank W. Egan & Co.
Gilbert & Nash Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John

FILLERS
American Cyanamid Company, Industrial Chemicals Division
A. M. Meincke & Son, Inc.
Vanderbilt Co., R. T.
Wyandotte Chemicals Corp., Michigan Alkali Div.

FILTERS
Bird Machine Company
J. M. Huber Corp.
Hungerford & Terry, Inc.
Johnson Corp.
Moore & White Co.
J. O. Ross Engrg. Corp.
The Sandy Hill Iron & Brass Works
Walworth Company

FITTINGS
The Bagley & Sewall Company
Crane Company
Shartle Bros. Mch. Co.
Walworth Company

FLEXIBLE COUPLINGS
Egan, Frank W., & Co.
Lovejoy Flexible Coupling Co.
John Waldron Corp.

FLOORING, GRATING AND TREADS
The Goodyear Tire & Rubber Company
Norton Co.

FLOW BOXES, STAINLESS-CLAD
Lukens Steel Co.
The Sandy Hill Iron & Brass Works

FORK LIFT TRUCKS
Clark Equipment Company Industrial Truck Division
Towmotor Corp.

FORMATION TESTERS
Thwing-Albert Instrument Co.
Williams Apparatus Co., Inc.

FORMING MACHINES
Black Clawson Company
Downingtown Mfg. Co.
The Moore & White Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

FREENESS TESTERS
Testing Machines, Inc.
Williams Apparatus Co.

GASKETS
The Goodyear Tire & Rubber Company

GEARS
The Bagley & Sewall Company
Black Clawson Company
De Laval Steam Turbine Co.
Downingtown Mfg. Co.
Frank W. Egan & Co.
Farrel-Birmingham Co.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Westinghouse Electric Corp.
Western Gear Works

GRAPPLES
Blaw-Knox Company

GRINDERS
Carthage Machine Co.
Farrel-Birmingham Co.
Gibbs-Brower Company, Inc.
Lobdell Co.
Norton Company
Samuel C. Rogers and Company
The Sandy Hill Iron & Brass Works

GRINDING WHEELS
Norton Company

GUIDES
The Bagley & Sewall Company
Egan, Frank W., & Co.
Gilbert & Nash Co.
The Moore & White Co.
Mount Hope Machinery Co.
John Waldron Corp.

GUMMING MACHINES
Dilts Machine Works
Egan, Frank W., & Co.
The Sandy Hill Iron & Brass Works

GUMS
National Starch Products, Inc.
Stein-Hall Co., Inc.

HEAT EXCHANGERS AND RECOVERY SYSTEMS
Stickle Steam Specialties Co.
Westinghouse Electric Corp.

HEATING, VENTILATING & AIR CONDITIONING
The Appleton Machine Co.
E. D. Jones & Sons Co.
General Electric Co.
D. J. Murray Mfg. Co.
Rad-Ray Mfg. Co., Inc.
Ross Engineering Corp., J. O.
Stickle Steam Specialties Co.
Valley Iron Works Co.
Westinghouse Electric Corp.

HOSE (Air, Water, Suction, etc.)
The Goodyear Tire & Rubber Company

HUMECTANTS
Aktivin Division, Heyden Chemical Corp.
Nopco Chemical Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

IMPREGNANTS
American Cyanamid Company Industrial Chemicals Division
B. F. Goodrich Chemical Co.

INDENTING MACHINES
Dilts Machine Works

INDUSTRIAL TRACTORS
Clark Equipment Company Industrial Truck Division
Towmotor Corp.

INKOMETER
Thwing-Albert Instrument Co.

INSTRUMENTS, TESTING AND MEASURING
Beckman Instruments, Inc.
Brown Instrument Co.
Bunge Pulp & Paper Co.
Cambridge Instrument Co.
General Electric Company
W. & L. E. Gurley
B. F. Perkins & Son
Photovolt Corp.
Taylor Instrument Cos.
Testing Machines, Inc.
Thwing-Albert Instrument Co.
Williams Apparatus Co.

JOINTS
The Bagley & Sewall Company
Johnson Corp.
Lovejoy Flexible Coupling Co.
Shartle Bros. Mch. Co.

JORDAN FILLINGS
Appleton Machine Co.
Bahr Brothers Mfg. Co.
E. D. Jones & Sons Co.
Shartle Bros. Mch. Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

KNIVES
Black Clawson Company
Dilts Machine Works, Inc.
Hamblet Machine Co.
Heppenstall Company
E. D. Jones & Sons Co.
The Moore & White Co.
Simons Worden White Co.
Taylor Stiles & Co.
Valley Iron Works Co.

KRAFT WRAPPING PAPERS
Canadian Newsprint Supply Co.

LABORATORY CORRUGATOR
Thwing-Albert Instrument Co.

LABORATORY EQUIPMENT
Appleton Machine Co.
Bauer Brothers Co.
Beckman Instruments, Inc.
Bird Machine Company
Dilts Machine Works
W. & L. E. Gurley
Egan, Frank W., & Co.
E. D. Jones & Sons Co.
Taylor Instrument Companies
Testing Machines, Inc.
Valley Iron Works Co.
John Waldron Corp.
Williams Apparatus Co., Inc.

LAMINATING MACHINES
The Bagley & Sewall Company
Dilts Machine Works
Egan, Frank W., & Co.
John Waldron Corp.

LAY BOYS
Dilts Machine Works
Gibbs-Brower Company, Inc.
Hamblet Machine Co.
Moore & White Co.

LIFT TRUCKS
Clark Equipment Company Industrial Truck Division

LINTER COTTON
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Northern Engraving & Mch. Co. — —
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Socony Vacuum Oil Co., Inc. — —
Sonoco Products Company — —
Sprout Waldron & Co., Inc. — —
Squier Corp., The — —
Stebbins Engrg. & Mfg. Co. — —
Stein, Hall & Co., Inc. — —
Stephens Adamson Mfg. Co. — —
Stickle Steam Specialties Co. — —
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Sun Oil Company — —
Sutherland Refiner Corp. — —
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Williams Apparatus Co. — —
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BUSINESS STAFF

Arthur E. Gordon, Business Mgr. — **Frederick B. Grosse, Production Mgr.**

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McDonald-Thompson Company

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Tensile Testers
Mullen Testers
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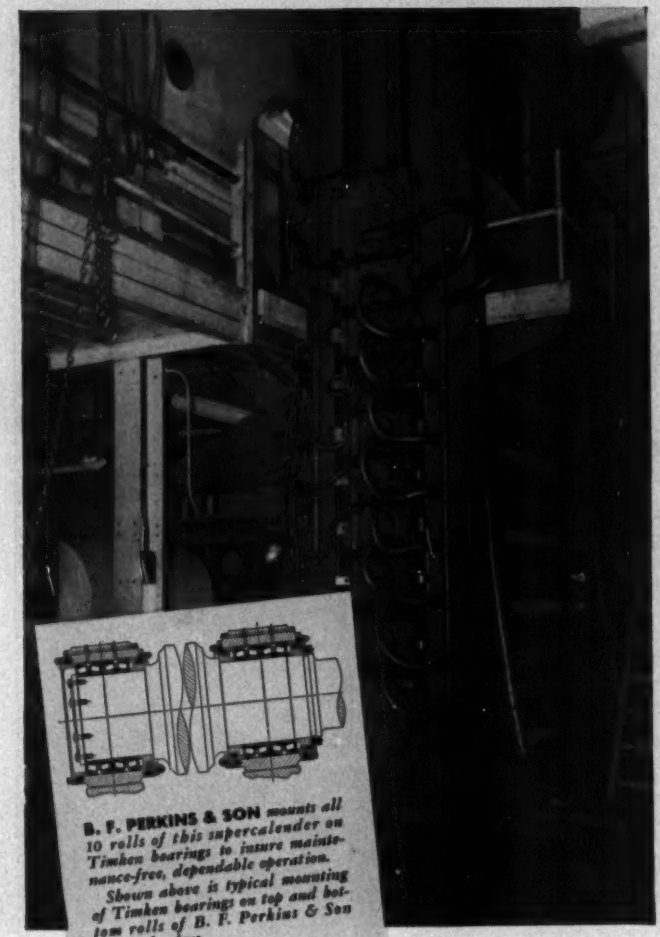
How Perkins keeps its supercalenders up-to-date



B. F. PERKINS & SON *mounts all 10 rolls of this supercalender on Timken bearings to insure maintenance-free, dependable operation.*

Shown above is typical mounting of Timken bearings on top and bottom rolls of B. F. Perkins & Son supercalenders.

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2. Line contact between rollers and races provides extra load-carrying capacity.

3. True rolling motion and an incredibly smooth surface finish enable Timken roller bearings to carry heavy loads with minimum friction.

4. Tapered construction enables Timken bearings to carry both radial and thrust loads in any combination.

5. Timken bearings permit the use of closures that keep lubricant in—dirt and moisture out.

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$$Value = \frac{quality + service + public\ acceptance}{price}$$

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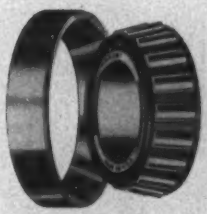

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